Pharmacy Practice Research Group

Pharmacy Practice Research Trust

MPharm Programmes: Where are we now?

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Key Findings

This study was funded by the Pharmacy Practice Research Trust. The aim was to undertake a comprehensive and systematic assessment of current approaches to teaching, learning and assessment in the 16 UK schools of pharmacy in 2004. It was carried out in 2004 and involved a pluralist methodology: a review of public documentation relating to pharmacy programmes, interviews with the programme leader and a senior academic in pharmacy practice within the 16 established schools (running a full programme with graduates) and a survey of final year students by self-completion questionnaire. The documentation review was completed in autumn 2004 and related to the programmes delivered in the academic year 2003/4. Interviews were undertaken between May 2004 and February 2005 and questions were related to the 2003/4 year. The student survey was undertaken in the autumn of 2004 and achieved an overall response rate of 51% (n=935) with 741 responses from students whose permanent residence was in the UK. This report is based upon responses from UK students.

As a result of the findings of this study it is recommended that:

1. An immediate further review of the accreditation process in partnership with the schools of pharmacy. The key issues for this review should include:
    a. A review of the status of the recommendations of the 1994 advisory committee on pharmacy education and in particular the volume indicators for formal contact and the requirement that all students complete a significant final year research project.
    b. Definition of the core pharmacy outcome qualities and standards that relate to professional fitness to practice. This will require review of the preregistration training process (see below).
    c. Fundamental review of the balance between requirements that relate to process and those that relate to the educational endpoints of the degree.
    d. Clearer specification of the core educational process so as to encourage diversity, choice and good practice.
    e. A comprehensive review of criteria relating to practice based learning to provide a clearer definition of the learning objectives which must be carried out in parallel with discussions on funding.
2. 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. This must include a significant input from the schools of pharmacy and from educationalists associated with preregistration training.
3. A review of the obligations of individual pharmacists and corporate operators to support the education of health professionals including pharmacists.
4. Formation of a joint working group between the RPSGB and the schools of pharmacy to develop a forward strategy with respect to the academic workforce and the access of additional funding to support the work-based clinical education of pharmacy undergraduates.

This study has also identified a number of areas for future educational research that impact directly upon the development of pharmacy undergraduate education. In all cases there is widespread interest within schools with some involvement in most schools. We recommend that in each of these areas, there is a need for more detailed research on current practice to inform development across the sector. These areas are:

1. Student centred learning.
2. Problem based learning.
3. The wider dimension of developing attitudes, values and beliefs within the overall education and training process for pharmacists.
4. Professional performance and its assessment.
5. Multi-professional learning.
6. Placement education.

1. Executive Summary

1.1 Context of the Study

E1. This study was funded by the Pharmacy Practice Research Trust. The aim was to undertake a comprehensive and systematic assessment of current approaches to teaching, learning and assessment in the 16 UK schools of pharmacy in 2004.

E2. There have been two major drivers for change in UK health professional education during the last 5 years. First, government policy articulated in the NHS Plan (2000) which sets out an agenda for modernising health services with patients as the focus. This had major implications for health professional education, which in the case of pharmacy have been amplified in the Department of Health (DOH) publications Strategy for Pharmacy (2000) and more recently Vision for Pharmacy in the New NHS (2004). These question traditional working practices, emphasise inter-disciplinary working and encourage new working practices including new professional services and continued professional development. The second driver for change is the tightening of professional regulation through orders under Section 60 of the Health Act 1999.

E3. Through its statutory powers, the Royal Pharmaceutical Society of Great Britain (RPSGB) has always had a controlling role in the development of pharmacy undergraduate education. Since the 1970s, the Society has had a powerful influence on curriculum and on course delivery through the establishment of an accreditation process. Accreditation has always been based upon an indicative syllabus with specific requirements in relation to competence in pharmacy law and ethics and dispensing practice. Since 2001, the indicative syllabus has been advisory and the key requirements are contained within 50 criteria relating to the provider, the graduate outcomes and the educational process.

E4. The accreditation process was augmented by the EU directive on pharmacy education (85/432/EEC) implemented in 1985. The Directive sought to harmonise first degree qualifications leading to entry to the regulated profession of pharmacy throughout the EU, but was framed as a list of specified syllabus subject areas plus a set of volume measures relating to the form, length and workload within the undergraduate and preregistration process. These requirements have been incorporated within the RPSGB accreditation framework and so are mandatory within the UK.

E5. The study was carried out in 2004. It involved a pluralist methodology: a review of public documentation relating to pharmacy programmes, interviews with the programme leader and a senior academic in pharmacy practice within the 16 established schools (running a full programme with graduates) and a survey of final year students by self-completion questionnaire. The documentation review was completed in autumn 2004 and related to the programmes delivered in the academic year 2003/4. Interviews were undertaken between May 2004 and February 2005 and questions were related to the 2003/4 year. The student survey was undertaken in the autumn of 2004 and achieved an overall response rate of 51% (n=935). This report is based on findings from the subgroup of UK students (n=741).

1.2 Curriculum Design

E6. All UK universities are required by their funding council to formulate a teaching and learning strategy. Most interview respondents (15/16) were aware of their institutional statement yet it was not a major influence on curriculum design within the pharmacy programme. Only 4/16 schools had a pharmacy specific statement.

E7. The RPSGB accreditation process was seen by school respondents as the most important external driver for curriculum design in all schools. None of the respondents mentioned the outcome criteria which had been introduced in the revision of the accreditation process in 2003 and which actually replaced the indicative syllabus as the prescribed requirement.

E8. The Quality Assurance Agency (QAA) benchmark statement for pharmacy was used by schools but it was regarded more as a hurdle to be met than a driver for change. There was also some (variable) awareness of changes in, and the needs of, the NHS (7/16) but these did not emerge as major curriculum drivers.

E9. The pharmacy degree programme prepares students for entry to the preregistration year, a professional placement with a competence based assessment, which then leads to professional registration. One school has a long standing sandwich programme in which the preregistration training is consolidated within a five-year academic programme. Respondents from schools considered that there was little or no formal interaction with the RPSGB on the preregistration year or on the articulation of that year with the degree programme. Thus the integration between graduate studies and preregistration is weak - a finding that has implications later in relation to the assessment of competencies.

E10. Schools are beginning to make accommodation for meeting the demands of the widening participation and disability agendas but on an “as needs” basis. There has been no impact upon curriculum with changes largely affecting delivery, but there were concerns over the lack of any clear professional policy with regard to registration.

E11. There was variability in the way in which schools maintained their curricula. 10/16 schools had a standing syllabus group that included representation from across the disciplines within the school. Schools were not constrained by instructional policies or requirements and had flexibility within their instructions to introduce special regulations to change normal procedures where this was occasioned by professional need.

E12. 14/16 schools had increased student numbers in the last 5 years. The increase had affected delivery of the curriculum rather than causing changes to the curriculum. There had been a reduction in small group teaching to compensate for the increased number of groups needed to handle the enlarged cohort.

1.3 The Curriculum

E13. 13/16 programmes had a clear modular structure. Two of these worked to the Scottish Credit Tariff, two to the European Credit Transfer Scheme (ECTS) and nine to the English Credit Tariff. Of the rest, 2 programmes were unitised rather than modular (based on a series of course units) and one programme had a semi-modular structure. Under the terms of the Bologna Agreement all programmes will have to move to the ECTS credit system by 2009.

E14. A content analysis of the published curricula showed that courses were broadly similar when the syllabi were divided into the main subject areas of pharmacology, pharmaceutics, medicinal chemistry, pharmacy practice and clinical/therapeutics. The other areas to take significant course time were microbiology and the final year research project.

E15. A content analysis of the scope of the curricula showed that directed student learning made a significant contribution to the overall student workload. The accreditation requirement that a pharmacy undergraduate programme should provide 3000 hours of directed work was achieved by inclusion of directed study. The average formal contact time was 1544 hours over 4 years.

E16. All respondents acknowledged the difficulty in balancing the curriculum - especially between science and practice. When the MPharm degree was introduced (1997) there was a major review of the science/practice balance which, in most programmes, resulted in increased practice and clinical content. Since then in most programmes, developments have been incremental. The documents showed a strong scientific base within the pharmacy undergraduate programmes, amounting on average to just over half the total curriculum time. On average, just under one third of curriculum time was focussed towards practice and clinical studies.

E17. About half the surveyed students considered the balance between science and practice to be about right; just under one third thought that there was too much science. Over half the students agreed that the focus on science subjects early in the programme was necessary to underpin professional and clinical studies in years 3 and 4. Students were concerned with the sequencing so that professional subjects are taught throughout the course - 70% considered there was not enough material relevant to pharmacy practice in the first year and 88% considered that pharmacy practice should be taught in all years.

E18. Schools were relatively insular. None shared a major component of the curriculum with other degree courses. In all, optional studies were very limited. 5/16 schools had no optional studies within the programme and where options were offered, they tended to be within the pharmacy spectrum. Only one school offered a business studies option. The main constraint on options was considered to be the demands imposed in meeting the RPSGB (and EU) accreditation requirements.

E19. Students favoured optional studies and only 8% were of the opinion that options should not be part of a pharmacy programme.

1.4 Teaching and Learning

E20. Individual teachers and module/course leaders determined the choice of teaching/learning methods used. Most schools had a review process which considered the balance of the programme. There was a general expectation that didactic teaching would be reduced through the programme with a corresponding increase in student self learning.

E21. The content review of documentary evidence showed that in all schools, lectures were the primary method of teaching, accounting on average for approximately half of the taught element across the entire programme. The range across schools was from 39% to 64% of the course as lectures, with a range from 577 to 892 hours of teaching.

E22. Students considered lectures to be an important method of teaching for the support of their learning - 75% rated them as very important. By comparison, tutorials and workshops were considered less important with less than 50% rating them as very important.

E23. After lectures, practicals accounted for the second largest component of formal teaching - an average of 27% of taught time across the programme (range 18% to 40%). Content analysis showed a wide range in the time dedicated to practicals - 282 to 657 hours of teaching time.

E24. Students considered that dispensing/clinical practicals were the most important teaching sessions for the support of their learning (considered very important by 92%). Science practicals were less highly regarded as a support for learning with only 31% rating them as very important.

E25. When asked how useful they had found practicals, students were strongly supportive of dispensing practicals (considered very useful by 92% of respondents). None of the

science practicals were considered very useful by more than 30% of respondents and medicinal chemistry was considered very useful by only 12% of respondents.

E26. The views of students on the importance and on the usefulness of practicals must be placed in the context of the accreditation requirement that 35% of the curriculum time should be in the form of practicals or sessions in which students analyse and handle data. Further study into student attitudes to practicals is indicated.

E27. None of the schools had a policy stating how much student centred learning should be included within components of the programme. Indeed, there was no clear definition of directed learning in most schools. Student centred learning was supported by a range of methods including library skills; IT through virtual learning environments (VLE) or computer aided learning (CAL). Assessment was variable but was usually summative in the form of tests or examinations.

E28. Students said that learning using a VLE was important for their personal learning but few supported its use in isolation and most preferred a combination of IT and traditional lectures.

E29. The pedagogic debate over types of learning was covered in the staff interviews. There was general awareness both of the concepts of “deep learning” and of the technique of problem based learning (PBL). Some difficulties in terminology and conceptual definitions limited the clarity of responses.

E30. All schools were supportive of the attainment of deep learning but in general this was an aspiration rather than built upon practice. All schools used problem solving exercises. 6/16 schools considered that they use PBL in its full format but only in a limited number of modules. All recognised it to be demanding on students, on resources and on staff. There was some interest in a shared approach by schools of pharmacy to the development of PBL and further detailed research is indicated in this area.

E31. With two exceptions, there was general support for the development of a Knowledge, Skills and Attitudes framework for pharmacy undergraduate education, provided that it was indicative rather than prescriptive.

E32. There was evidence of a focus upon knowledge in all the schools - contact was high with extensive use of written examinations to measure learning outcomes.

E33. Staff in all schools recognised the importance of developing generic skills and in half the schools there had been a full skills audit. The importance of professional skills was recognised but there were concerns over the extent to which these could be developed whilst undergraduate education was in isolation from practice.

E34. There were conceptual difficulties in relation to attitudes and when asked to define the most important attitudes, most gave the example of professionalism or a behaviour or characteristic that contributes to this (e.g. honesty). Attitudes were much less clearly defined or characterised than generic skills and this is an area for further developmental research.

E35. The majority of students considered that the overall workload on their programme was about right but a third considered it to be too high. There was some indication that students considered that their studies focussed too much on knowledge in comparison with essential skill development (57%).

1.5 Assessment

E36. 15/16 schools used examinations as the main form of assessment in the first three years of the programme. The one exception was due to an institutional policy not to use examinations in the first year. On average, examinations accounted for 66% of

total assessment. In the final year the research project accounted for the difference in emphasis. The contributions from examinations in the final year varied considerably between schools and consequently examinations made a variable contribution to the final degree classification.

E37. There were variations in the contribution of the different years of study to the final degree mark and coupled with the variations in the practice/science balance by year, this means that the relative contributions of the practice and science elements to the final degree classification varied considerably between schools.

E38. During the programme a variety of methods were used to assess coursework. More demanding approaches, such as presentations and Objective Structured Clinical Examinations (OSCEs), featured in the later years. 8/16 schools used video recorded interactions, 9/16 used OSCEs. It was noticeable that the definition of OSCE varied between respondents. 13/16 schools made use of peer assessment.

E39. The majority of students surveyed considered that the balance between examinations and coursework was about right. However, over 50% considered that assessments were too heavily weighted towards knowledge.

E40. In the majority of schools (11/16) the programmes were front loaded with science with the practice and clinical elements building in scale towards the end of the programme. Consequently in these schools professional elements of the programme contributed more heavily towards the assessment of the final two years.

E41. Staff had difficulty in defining competence to practice in relation to the undergraduate programme. The emphasis was upon assessment of pharmacy law and ethics and dispensing (see accreditation criteria 48 and 49). There was also general concern that assessments of practice skills were taking place in an artificial (non-practice) environment and therefore might be of doubtful reliability.

E42. Most schools undertook the assessment of dispensing in either year 2 or year 3 of the programme. Only 3/16 undertook assessment in the final year. There were some questions about the continuing importance and relevance of assessing dispensing within the undergraduate programme. Pharmacy law and ethics was assessed at variable points from year 2 to year 4.

E43. Concerns were raised by both staff and students about the volume of assessments in the MPharm degree. Although a majority of both groups considered that the amount of assessments for the MPharm was about right, there was also a general view that the formal assessment load for the MPharm was greater than on other degree programmes.

E44. Staff considered that the assessments measured the learning objectives of the modules but not necessarily the range of qualities and skills necessary to practice as a pharmacist. Students agreed. A majority considered that the assessments did not measure the skills they would need to practice as a pharmacist.

1.6 Multi-professional Teaching and Learning

E45. Respondents from 6 schools said that they provided a multi-professional learning experience with students from other health professions. In all cases this was of recent origin and involved discrete components of the programme. Three of these schools involved first year students and three final year students. One school was involved in multi-professional teaching and in five schools there was limited joint teaching with other science students.

E46. All the staff respondents were supportive of multi-professional learning and clearly articulated the potential benefits. The principal benefits were the development of a

wider view of the student's future professional role and a better understanding of other health professional groups.

E47. Staff with experience of multi-professional learning identified a number of potential barriers. They mainly involved issues of logistics: student numbers, movement of students to external sites, the achievement of balanced numbers between disciplines and the engagement of students from all the participating disciplines. A critical success factor was careful planning of the content of multi-professional sessions to match the student groups involved.

E48. Students from institutions offering multi-professional learning were generally favourable and just over a half agreed that joint learning should be a requirement for all schools. However, it must be recognised that students were from the final year cohort and would therefore not have had direct experience of current activities.

1.7 Placement Education

E49. Staff in all schools advised students of the benefits to be gained from undertaking vacational work in pharmacy. Two schools had a formal requirement for vacational work and in both it was guided by workbooks and logs of activity.

E50. All schools provide formal placements in local hospitals. In addition 2 schools provided placements in community pharmacy and one provided opportunities for placement in a GP practice or primary care organisation. Formal placements were most commonly undertaken in the final two years of the programme when students were more knowledgeable about practice.

E51. All schools recognised the need for more placement opportunities. Key issues that limited development of placement teaching were access to sites, the local capacity, resources both in terms of staff and funding and the logistics of timetabling, particularly when travel was necessary.

E52. Two schools had secured NHS funding via local workforce development directorates and this had allowed extension of clinical placements but there were some concerns about the long term viability of this funding stream and in particular, in the ability to match it to future demand.

E53. The clear gaps in the educational provision for placements were in community pharmacy, part of the commercial sector, and in primary care organisations and GP practices.

E54. Teacher practitioners made a very important contribution to both the implementation and development of placement education and were seen as a key resource by schools.

E55. A majority (84%) of respondents to the student survey had experienced a formal placement, mostly in hospital. Students strongly supported placement education and over half thought that it should be provided in every year of the programme.

1.8 The Research Project

E56. All schools included a compulsory project in the final year. On average the project accounted for 41% of the directed time in final year (range 26-61%). Most schools calculated project time as a combination of practical and directed study and the average rating was 347 hours (range 183 to 500).

E57. Differences in the contribution of the project to the final year and the weighting of the final year in the overall degree mark meant that there were marked differences in the contribution of the research project to the final degree class (average 18% with a

range of 8 - 29%). All schools used a similar assessment process with either double marking or moderation and input from external examiners.

E58. All respondents considered that allocation of project titles was a complex and time-consuming process. Increasing student numbers had made this more difficult. All schools provided some degree of student choice and half the students considered that they had been provided with sufficient choice.

E59. Preparation for the project through development of an understanding of research methods was variable ranging from formal courses to on-the-job learning to nothing. Where teaching was provided its timing was also variable in relation to the project.

E60. There were a number of concerns about the supervision of the final year project. There were a number of contributing reasons - increasing student numbers and the capability and capacity to supervise projects in the professional and clinical areas due to the research experience of available staff and the impact of NHS ethics and research governance procedures.

E61. Both students and staff were positive about the value of the final year project.

1.9 Concluding Remarks

E62. The accreditation process was the major external driver for curriculum design. There was considerable consistency in pharmacy undergraduate education and evidence that communication within the sector was generally good. However there was also evidence of insularity from other health professional education. Schools had little joint curricula with other disciplines and little or no choice to reflect different student interests and there was little evidence that changes outside the pharmacy sector were a major driver for curriculum development. There is a need to review the procedures and to involve schools in this process.

E63. The undergraduate degree was poorly integrated with the preregistration training process and this was a barrier to the development of practice and professional skills and aptitudes. A fundamental review which involves the schools is urgently needed.

E64. Approaches to teaching and learning were relatively didactic with a heavy dependence upon formal lectures and practicals. Although schools made extensive use of student centred learning, its definition and specification was largely left to individuals. Further research in student centred learning is indicated.

E65. There was evidence of innovation in teaching and learning approaches and it is suggested that further research should be undertaken in the application of problem based learning (PBL) within the pharmacy environment.

E66. Assessment was heavily focussed upon formal examinations whilst formal assessment of professional competence was largely based around law and dispensing. Current practice appeared to measure knowledge and performance rather than attitudes or approach. The lack of integration between the undergraduate degree and the preregistration process was seen by many staff as an impediment to assessment of fitness to practice. Further research in the area of professional performance and its assessment is recommended.

E67. Although a few schools were undertaking multi-professional teaching this was in its infancy. There is a need for detailed research in this area to inform development across the sector.

E68. Practice-based teaching (placements) was taking place in all schools but funding and support was largely ad hoc or based upon local arrangements which may not be robust in the medium term. Research is needed into the various models of placement

teaching identified in this study so as to identify the key issues and to provide an evidence base on the cost/benefit of this activity.

E69. In view of the changes in NHS research governance and research ethics, and taking account of the increasing resource requirements to maintain projects, it is recommended that there is a need to review and clarify the purpose of the project and to evaluate other alternative approaches to achieve this purpose.

2. INTRODUCTION

2.1 The Study

This study was funded by the Pharmacy Practice Research Trust. The overall aim was to undertake a comprehensive and systematic assessment of the current approaches to teaching, learning and assessment in UK schools of pharmacy. It was therefore envisaged as a baseline study to address the fragmentary state of knowledge about teaching, learning and assessment used within schools. Prior to this study the main source of systematic information about the educational activity in schools was the accreditation cycle of the Royal Pharmaceutical Society of Great Britain (RPSGB). However, the data provided for accreditation was confidential to the school and therefore was not disseminated. In addition, schools were accredited over a five year cycle and so information was not necessarily comparable. Within the educational system, the Academic Pharmacy Group, most notably through their biannual conference for teachers in schools, has helped to disseminate educational practice, as has the external examiner system. However, little of this activity has been published and the amount of published educational research from UK schools has also been limited.

There is, however, a compelling reason to gather information on pharmacy education. Health professions are currently in the process of unprecedented change. The Health Act (1999) makes provision (Section 60) for changes in the regulation of all health professions with increased public accountability, modernised regulatory and disciplinary procedures and new fitness to practice requirements. The definition of requirements and standards for entry to the professional register clearly impinges on undergraduate education and the preregistration process. This study was therefore timely but our approach had to be in the context of the changing environment of health professional education.

In determining our research strategy we have taken account of three main influencing factors for pharmacy undergraduate education. The first was the historical influence of the RPSGB, which has had statutory regulating powers for entry to the Pharmacy Register since 1868 and comprehensive authority for the form of preregistration education since 1908. The second was the more generic changes that have been influencing all health professional education and that has been driven by government policy over the last decade. The third was the pedagogic research that has shaped teaching and learning in the health professions, most particularly for medicine. These have provided the context for our study and the philosophical basis for the study design.

2.2 Education and the RPSGB

Through its statutory powers, the Pharmaceutical Society (later RPSGB) has had a defining role in the development of pharmacy undergraduate education in the UK. Indeed, education was a major factor in the formation of the Pharmaceutical Society in 1841, which was rooted in the need of the Chemists and Druggists for a representative body and for common educational and practice standards that would make them credible in their competitive battle with the Apothecaries. This was reflected in the objectives of its Royal Charter granted in 1843 and the power to restrict functions and titles to those who had demonstrated fitness through examination was confirmed in the Pharmacy and Poisons Act 1868. Further powers to prescribe periods of study and courses of study were given in the 1908 Pharmacy Act and these were implemented by the Society from around 1920. The educational powers were confirmed and extended in the 1933 Pharmacy and Poisons Act, which was the basis for the current statutory powers in the Pharmacy Act 1954.

It was the 1908 Act that set a relationship between the Pharmaceutical Society and pharmacy education that has continued to the present day. Although the Society formed its own school in 1844, the 1908 powers allowed it to set a national syllabus for pharmacy education and to act as the examining body for entry to the register. Initially the RPSGB awarded its own qualification (PhC) with tuition largely in municipal technical colleges. However, changes in

higher education within the UK resulted in a move in 1966 to all graduate entry to the profession. Although the Society then abandoned its role as an examination body, it continued to have a strong influence upon curriculum and course delivery through the establishment of an accreditation process. Initially, this took its form from the former role of the Society in approving PhC providers. Thus the accreditation requirements consisted largely of an indicative syllabus coupled with specific requirements relating to competence in pharmacy law and dispensing; seen at that time as the core areas relevant to the practice of pharmacy.

The generally prescriptive nature of the accreditation process was if anything augmented by the EU directive on pharmacy education which was agreed in 1985 (85/432/EEC)[1]. This directive was introduced to harmonise pharmacy entry qualifications within the European Community but it was framed as a list of specified syllabus subjects plus a set of volume measures relating to the length and form of the whole preregistration process. The indicative syllabus in 85/432 was strongly reflective of central European pharmacy education, with fourteen named subjects of which 10 were basic sciences and none reflected the growing clinical focus of pharmacy within the UK. However, under the terms of European Law, compliance with the new directive became an obligatory requirement for accreditation. In addition, the RPSGB incorporated within their accreditation specification the recommendations of an expert committee on pharmaceutical education which were published in 1994. These provided a further five volume measures that have been rigorously applied by accreditation panels and as a consequence have had a major impact upon the development of UK undergraduate degrees.

- That “the number of hours of such training should total at least 3000 directed and supervised by the academic staff of the institution concerned”.
- That “at least half the higher education course identical for every student should consist of theoretical instruction and at least 35% of that course should take the form of practical training”.
- That “at least one third of the whole course should be occupied by the components which collectively deal with the actions, uses and manufacture of drugs and medicines and a broad balance should be maintained between the other sectors of the course”.
- That “in addition to the core course, which all students must take, individual students should be able to select one or more optional pharmaceutical subjects from a list provided by the academic institution, to reflect their special interests”.
- That “each student should carry out a personally directed research project covering about three to six months under the supervision of the academic staff and present a paper or dissertation on the project”.

The first major change in accreditation requirements[2] was announced in 2002 after a lengthy period of consultation. This represented a significant change in approach. Although the practice of providing an indicative syllabus continued, the focus of the new process was upon 50 obligatory criteria. These were grouped into four sections: the requirements for EU approval as specified in European directive 85/432/EEC, general criteria relating to entry qualifications, a series of 17 criteria defining graduate outcomes and 27 criteria concerning the process of education and sub-divided according to student, degree course and structures of the delivering unit. Thus the new accreditation procedures provided explicit support for diversity and offered considerable scope for individual providers to determine the methods used to support and develop teaching and learning and the related assessment strategies.

However, the new criteria also posed significant challenges to educational providers since they defined an extended range of graduate competences and student learning experiences that really necessitated a fundamental review of teaching, learning and assessment methods. Several of the key criteria also reflect the wider health care scene and government policy on health professional education (see below). Examples are a primary focus upon the patient, the development of multi-professional education, the encouragement of work placed learning and a focus upon generic skills relevant to health professionals.

2.3 Influence of Policy upon Health Professional Education

Health professional education is directly influenced by health policy. It is possible to recognise two principal policy drivers for change in health professional education during the last 5 years. The first was the NHS Plan[3] which set out a radical agenda for modernising health professional education and training to meet the driving principles of equity of treatment, a focus upon the patient rather than the professional and modernising the approach to patient care through multi-professional involvement. Equivalent plans were also introduced for Scotland[4] and for Wales[5]. Changes in the NHS policy on education, training and development first articulated in the DOH publication "Working Together" [6] have also been reflected in the DOH strategy document for the pharmacy profession[7]. This set out a number of objectives with major educational implications including enhanced inter-professional working with review of inter-professional boundaries, continued professional development and new professional activities. The policy drive to extend the professional role of pharmacists was further developed in the government paper "Pharmacy Workforce in the New NHS" (2002)[8] which in addition stressed the importance of developing training and educational standards for the whole pharmacy workforce. This reflected a government drive to change and modernise education and training for all health workers and to increase the flexibility and mobility of the workforce by enabling switches in career and training paths[9]. These changes are directly relevant to "Agenda for Change", a major change in the NHS human resource strategy with the introduction of new pay bands and harmonised conditions for employees[10]. This is underpinned by a job evaluation process based upon a knowledge and skills framework[11] which allows comparison of roles, functions and responsibilities. This process of vocational mapping is of direct relevance to professional education and could provide a guide to key outcomes for undergraduate education. Another related approach is to identify key competencies for each professional group. The RPSGB has undertaken significant work around the competencies of the pharmacy workforce[12,13] which also has the potential to inform future education. Overall these changes are important as context to the present study since they reflect a changing view of health professional education with a greater emphasis upon fitness for purpose. One consequence is a growing need to define outcomes, not just in traditional academic terms, but also in terms of vocational skills and attitudes.

The second driver for change in health professional education has been the concerns over professional regulation expressed in both the report of the Bristol Royal Infirmary Enquiry in 2001[14] and the report of the Shipman Enquiry[15,16]. These have highlighted the need for an enhanced understanding of the meaning of professional competence and of fitness for practice. A number of health professions have already seen changes in their professional regulation through introduction of an order under the powers given by Section 60 of the Health Act 1999. These include nursing and medicine and in both cases, the new powers extend the professional regulatory function in relation both to competence to enter the professional register and fitness to continue in practice (revalidation). Core to this process is development of an understanding and definition of the nature of professional work and so a definition of the essential educational basis for practice. Increasingly, education is being viewed not only as a knowledge base but as a complex process involving skills, knowledge and attitudes.

At the time of this study, pharmacy was expecting to be subject to a Section 60 order in late 2005 or 2006 and therefore in our study we have explored issues relating to clinical competence, relationships between education and the professional regulator (RPSGB) and the wider issue of defining education for professional practice. In this respect we have drawn upon the "emerging health professional framework" that forms a core in the QAA benchmark for a range of 11 different health professional degree programmes[17]. Although currently pharmacy is outside this group, both the new accreditation requirements and the QAA Pharmacy Benchmark[18] reflect many of the values inherent in the framework.

2.4 Recent Developments in Pharmacy Undergraduate Education

By the 1960s traditional approaches to medical education were being challenged in face of the accelerating growth in both scientific and clinical knowledge and an increasingly overloaded curriculum. Research in the USA into the reasoning abilities of medical students demonstrated that few could relate the knowledge they had learned to patient problems. From this arose a learning concept that was first applied to medicine at McMaster University[19] but has since had major impact in many health-related areas - problem based learning (PBL). In essence this involves organising the curricular content around problem scenarios rather than subjects or disciplines. In educational terms, PBL is distinct from "problem solving learning" which presents students with problems with the expectation that they arrive at pre-set answers. With PBL there is no set of pre-determined answers - rather through engagement with complex ideas and issues, students develop their understanding. A common approach in PBL is the "case study method" first used in Harvard Business School[20] but now widely used within medicine and nursing education. Cases generally provide a puzzle or dilemma and the problem(s) is/are encountered and defined in the learning process. The Higher Education Funding Council for England (HEFCE) through its learning and teaching support network (LTSN) Generic Centre maintains a central website for PBL[21]. Listed users of PBL in the UK include a number for health professional courses including medicine, nursing and dentistry. Although pharmacy is not mentioned, we were interested to explore developments with the schools.

Computer aided learning (CAL) is another learning approach that was pioneered in medicine at McMaster University. As with PBL, it was introduced to try and improve learning but in this case by providing on demand interactive learning. In the UK, a national 'Computers in Teaching Initiative' for higher education was founded in 1985 and this provided support for the development of CAL. The subject specific centre for medicine was particularly active and national progress in this area is being maintained through the Higher Education Academy[22] subject centre for medicine, dentistry and veterinary medicine. In 1992, the schools supported by the RPSGB achieved government funding for the development of teaching software specific to pharmacy. The Pharmacy Consortium for Computer Aided Learning (PCCAL)[23] has since achieved significant success and a range of software has been provided to all UK schools. However, although funding from the consortium partners maintains the software, the consortium is no longer able to act as a lead for new developments. The success of PCCAL is well established and therefore in this study we focussed upon newer developments involving the use of IT in general learning support and in particular upon the use of Virtual Learning Environments (VLEs).

Pharmacy as a subject is represented in the Health Sciences and Practice Network of the Higher Education Academy.[22] As with medicine, this subject centre aims to provide support for providers to enhance the learning experience of students. In the wider educational context, there is increasing emphasis not only upon methods of learning and teaching but upon the characteristics of learning. The notion of "deep" and "surface" learning[24] first arose from phenomenographic research in the late 1970s into students' perceptions of and approaches to learning. There has been much debate on the way in which students can be helped to develop their learning style[25-28] and there is evidence that this is affected by the method of assessment[27 29]. The large body of literature on learning methods formed an important context for the present study.

In medicine the changing approach to teaching and learning was captured in the first publication of "Tomorrow's Doctors" by the General Medical Council in 1993.[30] This changed the focus of medical education from knowledge to a wider learning process that developed skills, professional attitudes and an ability to interact with others. It brought with it a review of learning methods, the development in several medical schools of advanced PBL and a concentration upon understanding rather than superficial learning. Some of the techniques that have arisen in medical education have wider applications. One is the use of Objective Structured Clinical Examinations (OSCEs)[31] to develop and assess patient focussed competencies. This approach involves a series of interactive examination sessions which are problem based and can

therefore test application of knowledge together with skills and attitudes. In pharmacy, published reports on the use of OSCE sessions mainly relate to the use of the method in preregistration training[32-34]. However, at the start of this study we knew from experience that this approach was in use in a number of undergraduate pharmacy programmes although often in modified format. A variety of other methods have also been reported including the use of recorded transcripts in pharmacy practice,[35] and the use of video delivered over the internet to support the acquisition of key formulation skills in extemporaneous dispensing.[36] Because of the relative lack of published educational research in pharmacy, it was our view that these reports were likely to represent only a small part of the activities in place in schools. As a consequence, exploration of innovations in teaching and learning and the experience of individual schools in the use of the above methods have formed an important part of this study.

A separate development in pharmacy education has been in the move towards multi-professional education. This is an area of education with significant difficulties in terminology. For the present project, we have defined multi-professional learning as that which involves students from more than one health profession, learning interactively with each other in areas of mutual interest. With the exception of optometry, pharmacy is the only UK health profession where first level education has no direct or indirect resource from the NHS. Nursing and many of the professions related to medicine (e.g. clinical science, podiatry) have always been directly funded by the NHS whereas in the case of the clinical subjects (medicine, dentistry and veterinary medicine), there is a special higher funding band from the HE funding bodies plus indirect funding for clinical learning from the NHS. Promotion of multi-professional working as a means to breaking down barriers between health professional groups was a key element of the NHS Plan[3] and has since been recognised as fundamental for all health workers.[37] As such it is a fundamental principal in the emerging health professional framework (see benchmark statement for nursing[17]).

Nationally there are a number of pilot projects and these have recently been reviewed by the 'Centre for the Advancement of Inter-Professional Education' (CAIPE) on behalf of the DOH. A series of selected case studies has been published on the internet of those pilots that met certain criteria, including the involvement of more than 3 health professional groups and an external validation process[38]. Several of these pilots are ongoing and this includes the "New Generation Project" funded by the DOH and run by the Universities of Portsmouth and Southampton which will involve joint teaching of pharmacy undergraduates with those from a number of related disciplines including medicine. An aim of the present study was to undertake an audit of joint learning of pharmacy undergraduates with those of another discipline (inter-disciplinary learning) and to explore the extent of multi-professional learning involving pharmacy undergraduates.

Workplace based learning has always been a major component of medical education and this was significantly enhanced in the response of medical schools to the original "Tomorrow's Doctors" initiative. More recently there has been considerable emphasis upon the importance of hands-on clinical placements for all health professional students[37 39 40] and recognition of the need to manage this process. In 2001, the National Audit Office published a review on the education and funding of the health professional workforce in England that made a number of key recommendations on provision for clinical placements[41]. Reorganisation of the local management of NHS education and training under the local Workforce Development Confederations (WDCs) followed almost immediately upon publication of this report and these organisations therefore assumed responsibility for local provision. In 2004 a further reorganisation of NHS structures saw the WDCs change to Workforce Development Directorates (WDDs) within the newly formed Strategic Health Authorities (SHAs). At the time of writing this report, each WDD has variable autonomy within their SHA.

One of the criteria for the accreditation of pharmacy undergraduate degrees is that students should obtain first hand experience of practice. Placements of students, normally final year, in the hospital service have been a component of most pharmacy courses since the early 1980s. Initially this was usually achieved by partnership between the school and the local NHS hospital

and this activity gave rise to a new category of teaching staff - the teacher practitioner. There have been a number of individual reports on the development of these posts and of clinical teaching in the pharmacy curriculum[42-46]. More recently a new scheme has been reported that involved clinical tutors with increased teaching of final year students within the hospital environment.[47] The importance of this aspect of health professional training and the priority given to it in the NHS plan and in the DOH Strategy for Pharmacy[7] suggest that a review of current practice in schools is timely.

Medical education has long emphasised the importance of maintaining both knowledge and professional skills[30]. The current requirements for undergraduate medical education set out in "Tomorrow's Doctors 2003"[48] are closely tied to the principles of good medical practice and standards of competence defined in "Good Medical Practice".[49] Key amongst these are the obligations to keep up to date and to maintain performance through systematic audit. The development of life-long learning skills is also a key component in the QAA emerging health profession framework[17] and has been widely promoted in a number of government policy documents on health education.[50 51] In the revised accreditation requirements for pharmacy[2], criterion 7 requires educational providers to ensure that the graduate "takes personal responsibility for his/her learning, developing a foundation for subsequent continuing professional development". There is little information available on how individual schools[52] are approaching this element of the educational process and much to learn from the approach used in medicine. Again an aim of this study was to collate the various approaches in schools to provide a baseline for the future.

2.5 The Layout of this Report

The results of this study have been presented in six main sections. The first three focus upon undergraduate programme design and delivery (curriculum chapter 3), teaching and learning (chapter 4) and assessment (chapter 5). There are then three sections focussing upon areas that are of particular current interest or significance - multi-professional teaching and learning (chapter 6), placement or workplace education (chapter 7) and the final year research project (chapter 8). A final concluding section (chapter 9) draws together those areas that we recommend worthy of further, more detailed study. Each of the chapters has been written to stand alone and therefore there may be some duplication where topics are relevant to more than one of the sections.

2.6 Methods

A detailed description of the methods used in the study has been included as an appendix to this report (Appendix I, page 79). This section therefore provides a brief overview of the methods used. We used a pluralist approach based upon three main research methods - semi-structured interviews with senior staff, a content analysis of data relating to the pharmacy programme and a survey of all final year students using a self-completion questionnaire.

Before the study began, each head of school was contacted to seek permission for the study. All agreed. Each head was also asked to identify two staff - one the member of staff in overall charge of the MPharm programme (i.e. the programme leader or leader) and secondly a senior member of staff in pharmacy practice who could comment on the professional side of the programme. The aim was to interview each of these staff members separately and two interview schedules were designed and piloted (see programme leader appendix II page 85 and senior staff member pharmacy practice appendix III page 88). A third schedule of topics relating to special areas of teaching was designed for use with both staff members (see appendix IV page 91). A total of 24 interviews were completed in the 16 schools because in 3 schools the staff concerned asked to be interviewed together and in 5 schools the programme leader was also the senior member of staff in pharmacy practice. Prior to visiting the schools to conduct interviews, we contacted the lead staff to obtain course documentation (see page 79). This was subjected to contact analysis and the information provided in the interviews was cross-checked wherever possible with that in the programme documentation. However, where

the interview went beyond the scope of the documentation, the information provided in the interview clearly represented the views, experience and knowledge of the individual respondents. All interview respondents were sent an outline of the interview schedule one week prior to the interview which was taped and then transcribed by an audio typist.

The design of the student questionnaire was partly based upon a series of focus groups that we undertook with students attending the British Pharmaceutical Students Association (BPSA) annual conference in 2004. The results from these focus groups have not been included in this report but are available separately. The survey of students was distributed to all final year students via their school of pharmacy. Most (11) schools provided a final year class list and the questionnaires were delivered to these schools in named labelled envelopes. Four schools used different distribution methods and one declined to participate in this part of the study (see page 81). 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. The overall response rate from 1847 students was 50.6%. However, the response rate from individual schools varied from 14.4% to 84.6%. The limitations of the survey have been described in more detail in the detailed methods appendix (see page 82). Because of the variable response from schools, detailed comparisons between individual schools has not been attempted. Finally, this report presents data only from the UK subgroup because of the number of overseas students at one school who only complete the final year of their education within the UK. Since these students take the first three years of their degree outside the UK the views of this subgroup upon the overall student experience would not be comparable with other students.

3. CURRICULUM

3.1 Curriculum Design

3.1.1 Influence of Institutional Strategy

In this section we explored the influences upon curriculum design. All Universities are required to formulate a teaching and learning strategy which has to be submitted to, and approved by, the relevant Higher Education Funding Council. In England, this is a condition of continued funding from the English Council (HEFCE). The teaching and learning strategy is a statement of the institutional aims and the philosophy and might therefore be expected to be a significant influence on curriculum design. In the interviews with key staff it was clear from responses that although most of the respondents (15/16) were aware of the institutional statement, it was not a major factor in curriculum design for the pharmacy programme. This is demonstrated by the finding that only four of the 16 schools had a pharmacy specific statement - including the one school in a single discipline institution.

3.1.2 External Drivers

When asked to identify the most important external drivers, all respondents mentioned the RPSGB accreditation process. Programme Leaders were more likely to focus upon the accreditation process as the key curriculum driver and several mentioned detailed mapping exercises to the indicative syllabus.

"Well, the process of accreditation and the RPSGB, we were very interested in the revised indicative syllabus of course and given that we were reaccredited a year ago, we did quite a lot of mapping exercises relating to the revised syllabus. I think that's by far and away the most important external issue". (Q1).

"A good example is pharmacist prescribing - that is something that has to go into the syllabus because the Society says it has to go into the syllabus and so we do it". (Q2).

Others, whilst recognising the importance of accreditation, took a more relaxed view of the indicative syllabus.

"Well obviously there is the RPSGB indicative syllabus though I would probably have the backing of the Dean if I said that for us, it's a guide. It's not something that we follow slavishly". (Q3).

Interestingly, none of the respondents mentioned the outcome criteria which were introduced in the 2003 accreditation process. These describe broad graduate qualities to be achieved at the end of the programme and replaced the indicative syllabus as the obligatory requirement for accreditation. Although it is probable that schools that have not submitted under the new process may not have identified the changed priorities, the general lack of recognition by schools accredited since 2003 is interesting. It seems probable that this reflects the strong historical link between accreditation and an indicative syllabus which is also reflected in the current EU directive for pharmacy.

The second most commonly mentioned external driver for curriculum was the QAA subject benchmark for pharmacy - mentioned by 12 of the 16 programme leaders. However, respondents generally held a different view of the benchmark statement compared with accreditation and regarded it more as a hurdle that had to be achieved rather than a driver for change.

"We're aware of it. When it appeared we were confident, if you like, that we agreed - it's a fairly bland document…just the fact that we were comfortable with the fact that we were OK - we don't make much use of it beyond that". (Q4).

Respondents from seven of the 16 schools mentioned external changes and needs in the NHS including links with the local workforce development directorates (WDDs). In one school staff were also teaching on a medical degree and here the respondent mentioned the influence of this experience upon curriculum design. A respondent from one school referred specifically to government policy, NHS policy or trends and experience in health related education. In general, however, these influences appeared subsidiary to the accreditation process and in this respect, pharmacy appeared to be relatively introspective in terms of the external influencing factors.

3.1.3 Professional Steering Groups

Four schools had advisory groups which included external pharmacy practitioners and representation from pharmacy employers. In one case this was not active on an ongoing basis but was formed to advise on an as needs basis. One example of good practice innovation was the employers group at University M. Others had involved external input, either on a formal or informal basis, at various times in the development of their programmes or around the accreditation visit from the RPSGB. The programme leader from one school mentioned external involvement of an academic pharmacist in the annual internal quality review of the programme. However, although others did not mention this, it is likely that most had some external input into the longer term internal programme reviews or revalidations.

3.1.4 Relationship with the Preregistration Process

In the main, pharmacy programmes prepare students for entry to the preregistration year which itself leads to eligibility to sit the RPSGB's own examination and – if passed - professional registration. In one school the preregistration is contained within a five year academic programme but otherwise conforms to the standard requirements. The preregistration year is now competence based with competencies assessed by the supervising tutor, but overall success is assessed by the combination of the competencies and an end of year Multi-Choice Question examination. This is an unusual pattern for health professional education in the UK where the professional placement is usually integrated with the campus-based university education and assessed within the university course. The degree awarded by the university then of itself leads to eligibility for admission to the relevant professional register and – for "sectoral" professions – listing in the relevant European Directive. It means that for pharmacy the total package of learning and assessment is the degree programme plus the preregistration year and the registrable qualification (ans as listed in the Directive) is the Memebership of RPSGB (MRPharmS) (and not the MPharm). We were therefore interested in the extent to which the preregistration year influences the undergraduate curriculum and the level of communication between the RPSGB who manage the preregistration requirements and the schools.

There was a strongly held view from all schools that there was little or no formal interaction with the RPSGB on the content of the preregistration year or on the articulation of the degree with that year. Rather, the two were viewed as separate processes. Typical responses to a question about whether the RPSGB does enough to ensure seamless transition from the degree to the preregistration training were:

"Well it's really quite a separate process". (Q5).

"I don't think the Royal Society of Pharmacy does anything! It's hard to answer that in all seriousness, there seems to have been very much of a divide between the two". (Q6).

"I think there is a big problem because we are not required to produce somebody to do something, they have to know about it, not actually do it". (Q7).

Respondents considered that schools were very reliant upon the knowledge and experience of staff, including sessional staff and teacher practitioners. Some were well informed on the preregistration process because of staff who were involved in the RPSGB's Board of Examiners; others had staff with experience as a preregistration tutor. However, in general the articulation between the schools and the Society was weak and as a consequence there was

no evidence of a robust link between graduate studies and preregistration training. Further evidence of this was revealed in discussions regarding assessment of professional competence (see section 5.3, page 50).

3.1.5 Widening Participation (WP) and Disability

All the respondents recognised the growing importance of widening participation and disability and spoke of the difficulty in dealing with them. Three schools recognised the issue but had not yet experienced it directly but in most cases, accommodation had been made for individuals on an "as needs" basis but in no case had there been changes to curriculum. A typical response was:

"*Not the design of the curriculum as far as I'm aware, it does affect the way that we run it. They're [the students] not exempt from that part of it so everyone takes the whole course. It's just the way that they take it might differ if they are disabled". (Q8).*

There was no clear view of the extent to which provision could be changed whilst maintaining fitness for preregistration entry and several respondents showed some unease at the potential. One clearly indicated that they considered this an issue for the RPSGB:

"Our experience is that if you ask them [the RPSGB], they won't make a decision until the very end [of the degree]". (Q9).

The difficulty of providing advice to applicants was also recognised and one programme leader who had direct experience of difficult disability issues spoke of the dual responsibility of both the educational provider and the RPSGB.

"It's difficult to know what advice to give out at the beginning of the course - if they ask us advice when they come on the course and similarly with regards to prereg. We are looking quite closely at this - about how to distinguish what advice to give them for the degree and what advice to give them for prereg. But of course Pharm. Soc. are looking at this aren't they?" (Q10).

3.1.6 Internal Management of the Curriculum

There was some variability in the way in which schools maintained the curriculum. All schools had a clearly identified programme leader for the MPharm programme. Ten of the 16 schools had a standing syllabus group that included representation from across all the disciplines within the school. In these cases, the committee was charged with ongoing responsibility for development of the curriculum and was usually chaired by the programme leader. In a further 4 schools there had been a syllabus group convened to review the syllabus but this was not a standing committee and ongoing responsibility resided with the programme leader. For example, in one school a curriculum group was convened every 5 years to undertake periodic review. In two schools a syllabus group had just completed a major review. Two schools had different structures that reflected their individual nature. In one, the school comprised two autonomous departments, both with a standing syllabus group. The final MPharm syllabus was then decided by an over-arching management group with input from both departments. In another, the syllabus was developed by course teams each responsible for one semester in one year. Overall curriculum balance was maintained by interaction of the course teams (each with a leader), subject group heads with line management responsibility for staff and the head of the school. In one school the responsibility for curriculum lay with the programme leader.

3.1.7 Organisation of Staff within the School (Subject Groups)

Traditionally, schools were often divided into sections or departments representing the different pharmaceutical disciplines. This survey has shown a significant trend away from this organisational structure towards an integrated approach to curriculum design. All the schools had some type of group structure for staff but in only one was curriculum clearly linked to the groups and in this school there was a unique arrangement of two independent departments.

Delivery and detailed content was in most cases the responsibility of the module group. Two schools had deliberately separated the curriculum design from subject groups with a view to developing an integrated curriculum.

In general about one third to half of the staff in schools had pharmacy degrees. It was more difficult to ascertain the number on the register but at the time of the study, it appeared that most were still registered. There was general agreement that the number outside pharmaceutics and pharmacy practice was falling and a view that with time, pharmacists would be confined to these areas. A number of respondents expressed concern about the recruitment position.

3.1.8 Internal Constraints

In general, the institutions that offer pharmacy recognise the special nature of the provision and the schools have exemption from institutional arrangements for non-subject specific “optional” teaching. The basis for this exemption is the accreditation requirements of the RPSGB. One school was located within a University which offered an option system for all degree programmes. The respondent regarded this as a strength of the educational provision in that it encouraged diversity. A few schools mentioned inter-disciplinary teaching as an internal constraint on curriculum development, particularly in the early years of the programme. One school was running the MPharm programme in an international market with students studying the final year in the UK. The respondents from this school recognised this had significant implications for curriculum design but considered that their programme met all the accreditation requirements.

3.1.9 Effect of Student Numbers on the Curriculum

All but two of the schools had experienced increases in student entry numbers in recent years and three schools described the increases as large. One of the schools that had not increased numbers was affected by an increase in intakes across the University. This was seen as a problem in relation to the availability of pool rooms, particularly for small group teaching.

The general view was that student numbers had affected delivery rather than the curriculum itself. The pressure points were:

- Small group sessions - increased number of groups with increased demand on facilities and staff or increased number in groups which limits what can be done.
- Practical classes - more groups and larger groups with significant implications for assessment. A number of schools have introduced new methods of assessing practicals, such as utilising a VLE.
- Less individual student attention possible.

3.2 The Curriculum

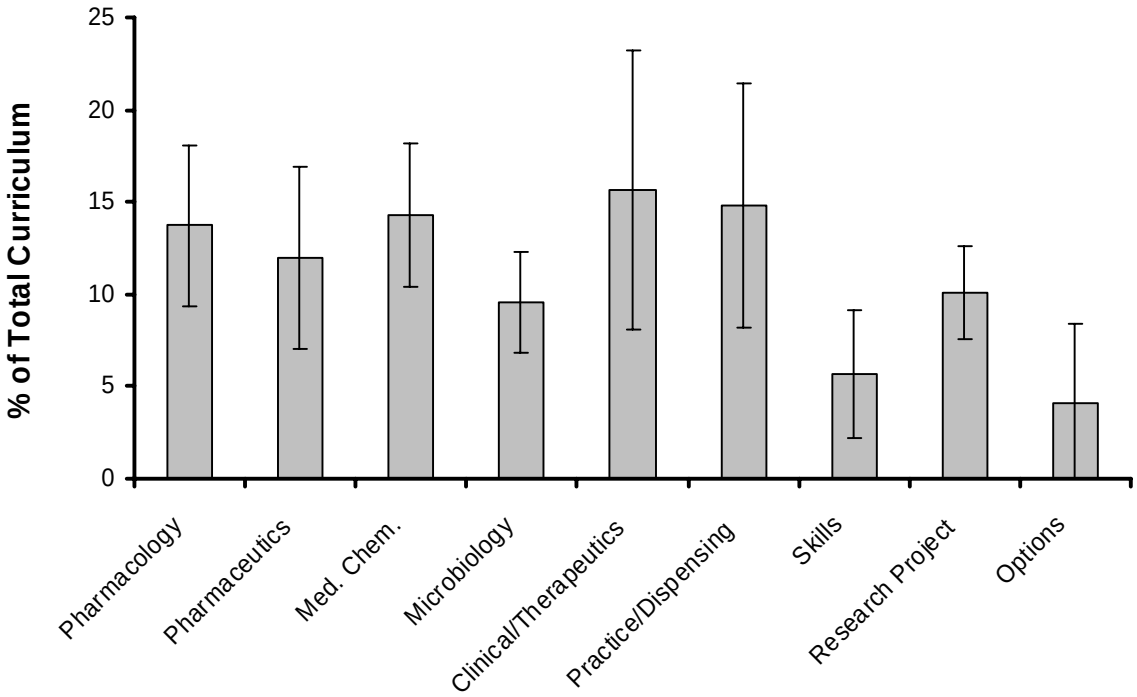
3.2.1 Curriculum Content

Of the 16 programmes examined, 13 had a clear modular structure. Of these, two worked to the Scottish Credit Tariff, two to the European Credit Transfer System (ECTS) and nine to the English Credit Tariff. Two programmes in London were unitised rather than modular being built of a series of course units. One programme had a semi-modular structure - with the last two years operating as course units with module equivalence for award calculation. The majority of programmes were semesterised - 2 were not semesterised and one was moving back to a yearly based assessment system. Under the Bologna agreement, all programmes will have to move to the ECTS credit system by 2009.

Figure 3.1 summarises the data from a content analysis of the published curricula in the 16 UK schools. Each curriculum area is shown in terms of percentage of total taught time within the

programme. In general, the average data shows approximately similar content in the five main curriculum areas: pharmacology, pharmaceutics, medicinal and pharmaceutical chemistry, clinical/therapeutics and practice/dispensing. Two other areas have significant course time - pharmaceutical microbiology and the final year research project. The largest variation was seen in clinical/therapeutics and this was mainly due to the outliers - in three schools (D, I and N) more than 25% of the curriculum was in this area. Conversely, the smallest variation was in the area of chemistry - although in this case one school had a notably lower content than others (D) at 8% of the curriculum.

Figure 3.1: Curriculum by Subject Area for the 16 UK schools of pharmacy, 2004. Data shown as mean and standard deviation (n=16).



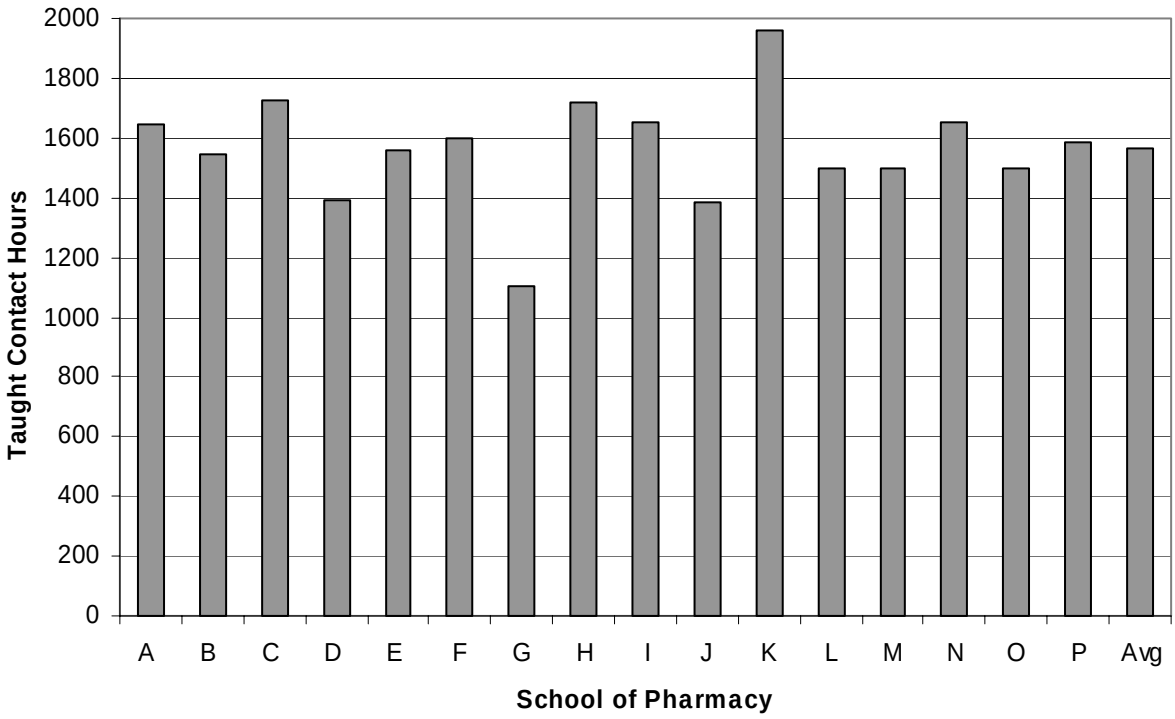
There are difficulties in this analysis. There are clearly overlaps between subject areas and this can lead to problems in the separation of time. The most notable examples were the overlap between clinical therapeutics and pharmacology and between pharmacy practice and pharmaceutics. Overall, however, the data provides evidence of considerable similarity in the allocation of curriculum time within the 16 UK schools.

3.2.2 Curriculum - Scope

As described above, the EU directive for the harmonisation of pharmacy curricula places specific demands in relation to the size of the taught course (minimum of 3000 hours of directed study). The Quality Assurance Agency (QAA) UK credit tariff would rate a four year degree at a total of 4800 hours of student effort. In most universities, the modular credit tariff sets the total formal contact at a maximal allowable proportion of total student work - usually about 30%. This would allow a total contact on a programme of around 1400 hours - less than half the load required to meet the EU directive. Figure 3.2 summarises the total taught hours in UK schools of pharmacy as determined from published course documentation. It can be seen that all but one school is either at or above 1400 hours over the programme. The average contact hours were 1544 hours over four years with a range from 1104 to 1961 hours.

However, all UK schools have extended their curriculum to include formal directed study; also referred to as directed or managed student learning. This is time for students to undertake set tasks - ranging from practical write-ups, computer assisted learning (CAL) to directed reading. Leaders of programmes in the schools were asked about directed study, an important element of student centred learning (see section 4.2, page 40). The method of determination of directed study varied considerably. In some schools it was calculated by an algorithm based on contact hours and the nature of these hours (practical, lecture etc). In others it was set for each individual module or course unit in line with the expected learning outcomes of the module or unit. In the 15 schools for which data on directed study was available, it accounted for just under half of total student workload (49%, range 28% to 66%).

Figure 3.2: Total taught curriculum hours in UK schools (A to P) over the four-year degree. The average for the sector is shown in the right hand column (Avg).

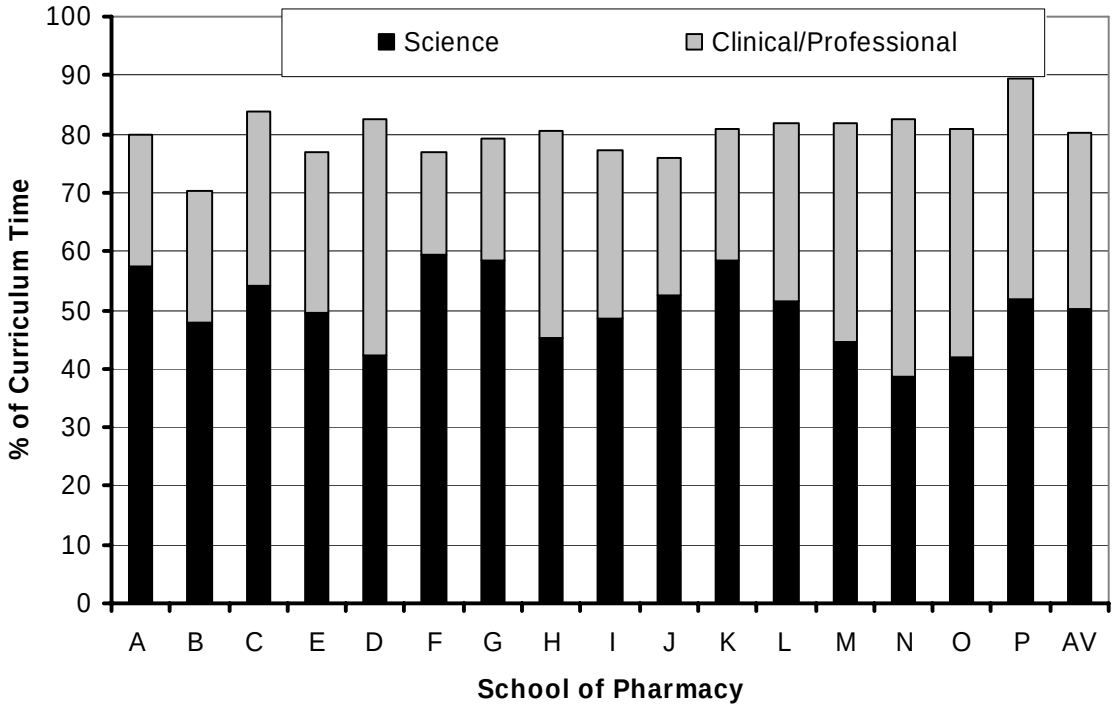


3.2.3 Curriculum Balance: Science and Professional

All the school respondents recognised the difficulty in balancing the curriculum - particularly the balance between science and practice. There was widespread support for maintenance of the science base but recognition of the vested interest of staff in their own discipline. In all schools it was stated that a major review of the science/practice balance had been undertaken when the MPharm was introduced and in every case this resulted in increased practice and clinical content. Since then, most schools had seen the curriculum develop incrementally. One school had recently completed a major review of the curriculum with introduction of inter-professional learning but even here, there was a view that the practice/science balance had not changed much. Two main reasons were given: firstly, the difficulty of changing teaching balance when there was little possibility of changing the relative number of staff in the various disciplines. Secondly, the impact of the RAE was another factor which was considered to provide a strong drive towards science research. Several respondents saw the issue of science/practice balance as a critical factor - one referred to it as "*a battle for the soul of pharmacy that is going to run and run" (Q11).*

Figure 3.3 summarises the balance between the professional/clinical and the pharmaceutical sciences in the UK schools for the academic year 2003/4. The data is based upon the total taught hours in the two areas - very similar findings result from analysis by credit load but with the complication that two schools do not use a modular credit tariff. The totals in Figure 3.3 do not add up to 100% because of the exclusion from the calculation of the research project (8% of the average curriculum - see section 8.3 page 66) and of options and skills modules.

Figure 3.3: Balance between Pharmaceutical Sciences and Clinical/Professional subjects within the Curriculum of UK schools, 2003/4. Percentages based upon taught hours. AV denotes the average for the sector.



In all schools the project could be selected in a science or practice/clinical area. On average just over half (51%, n=16) of the curriculum time could be attributed to pharmaceutical sciences and under a third (31%, n=16) to professional and clinical subjects.

Figure 3.4 shows the contribution of pharmacy practice to taught hours by year of the programme for the 16 UK schools. When the courses were analysed by year of programme it could be seen that in general the science was front loaded, with practice (including clinical) building in years three and four. This analysis is based on hours taught in the main science disciplines (pharmacology, pharmaceutics, medicinal chemistry, microbiology) compared with those taught in pharmacy practice and clinical - it excludes options, projects and skills modules. On average, practice contributed 13% of teaching in year 1, 28% in year 2, 45% in year 3 and 75% in year 4.

3.2.4 Curriculum Balance: Students' Perceptions

The survey of final year students contained a number of questions that explored student perceptions of the science/practice balance of the curriculum. Figure 3.5 shows responses of the 741 UK respondents to the question on the time devoted to pharmaceutical sciences across the whole curriculum. Just over half (53%, n= 391) considered the amount to be about right although just over a third (36%, n=267) that there was either too much or far too much. There was no association between school of pharmacy and these responses (P>0.5, Pearson's Chi).

Figure 3.4: Percentage contribution of Pharmacy Practice (including Clinical) to the total taught hours by year of the programme for UK schools of pharmacy.

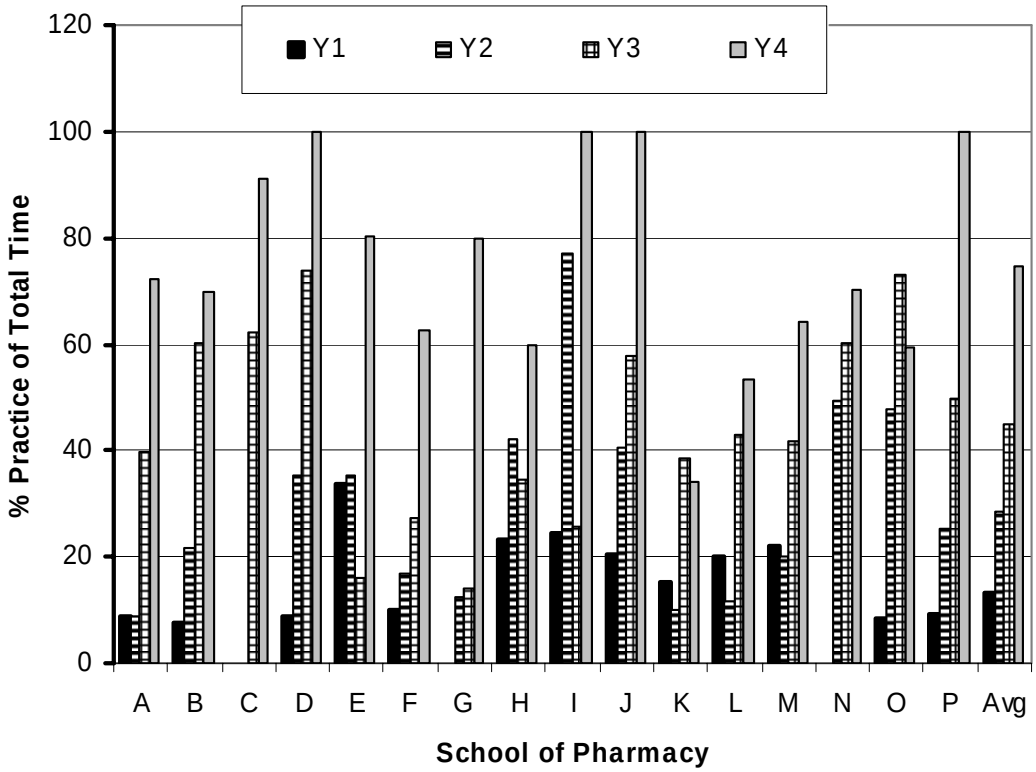


Figure 3.5: Perceptions of Final Year UK Pharmacy Students on the time devoted to Pharmaceutical Sciences over the whole MPharm Curriculum.

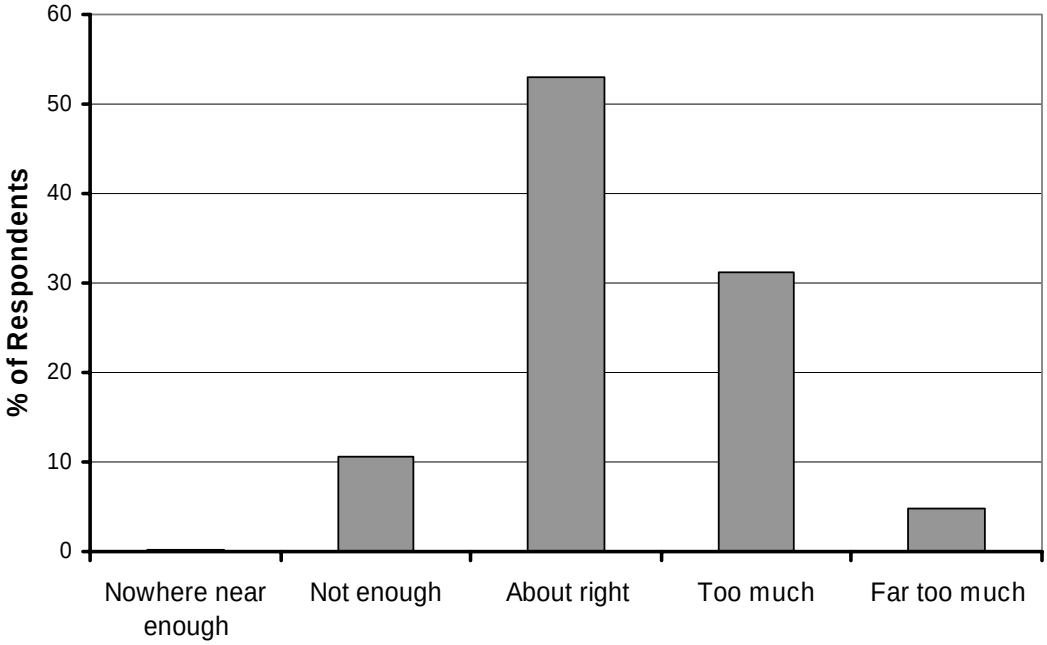
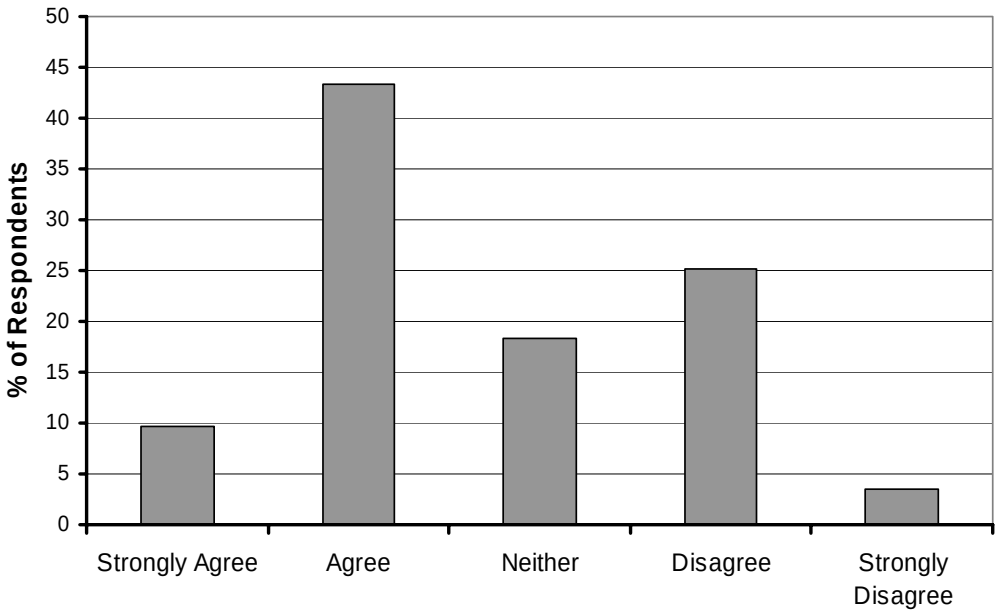


Figure 3.6 summarises the responses from a related question as to whether the science content in the early part of the course was necessary for the professional studies in years 3 and 4. A majority (53%, n=392) either agreed or strongly agreed whilst 18% (n=136) had no view. There was no association between school of pharmacy and these responses (P>0.5, Pearson's Chi).

Figure 3.6: Perceptions of final year UK Pharmacy Students as to whether the science content of the curriculum was necessary for professional studies in years three and four.



A different view emerged when students were asked about the proportion of material in the first year that was of relevance to the practice of pharmacy. An overwhelming majority (70%, n=514) considered that there was either nowhere near enough or not enough material whilst most of the remainder (28%, n=205) considered the amount to be about right. It is likely that the students' responses were related to either the sequencing of work or to its presentation in a pharmacy context since in most schools, science is focussed in the early years to provide a

basis for later professional and clinical studies. Students were strongly supportive of the inclusion of both traditional pharmacy practice material (pharmacy law and ethics) and of clinical pharmacy in all years of the programme (see Table 3.1).

Table 3.1: Agreement of Final Year UK students in schools on whether (a) pharmacy law and ethics and (b) clinical pharmacy should be taught in all years of the programme.

Response	Dispensing and Law and Ethics should be taught in all years of the MPharm (n=741)	Clinical Pharmacy should be taught in all years of the MPharm (n=741)
Strongly Agree	34% (n=249)	43% (n=319)
Agree	48% (n=352)	45% (n=330)
No View	5% (n=40)	6% (n=42)
Disagree	11% (n=81)	6% (n=42)
Strongly Disagree	3% (n=19)	1% (n=8)

Our study of course documentation showed that all schools introduce professional education in the first year but the amount and nature is variable. In contrast, the "Tomorrow's Doctors" curriculum[48] for medical education has a strong focus upon professional education from the first day of the course. However, the preliminary focus groups with students attending the BPSA conference (separate report available, see introduction section 2.5 page 20) revealed significant criticisms of the first year of the pharmacy programme. The survey included a number of quotations derived from the focus groups and we asked respondents to indicate their agreement with each. The results in Table 3.2 have been dichotomised. This data provides strong support to the concerns about the first year content and in particular, about its focus and balance.

Table 3.2: Agreement of final year MPharm students on statements relating to the first year of the MPharm Programme.

Statement	Agree or Strongly Agree	No Opinion	Disagree or Strongly Disagree
"I think the first year is all about what you did at A-level but its basically a bit further up"	70% (514)	10% (77)	20% (149)
"The first year is really irrelevant to the rest of the degree"	41% (307)	17% (126)	42% (308)
"There should be more pharmacy practice in year one - to allow continual development of skills"	82% (607)	10% (73)	8% (60)

3.2.5 Optional Studies within the Curriculum

Analysis of the course documentation showed that five of the schools had no provision for optional studies within their curriculum. In the remaining schools, options are generally in either the third or final year of the programme and in one school these are linked to the project to provide the opportunity for significant specialisation. In all schools, the core curriculum is dominant. Overall:

- The number of credits given for options range from 30 to 10.
- Where options do exist the choice of options ranges from 3 to 7.

Most of the options are pharmacy related, in its widest sense to include health psychology and health education. This subject allows the introduction to students of non-pharmacy teachers. One school includes Business Studies. One has options outside the course, such as French, because *'the University thinks that they are useful'*. One school is linked to Erasmus programme, where 30-40 students go to overseas Universities for 4 to 6 months. One school has displaced options to fit in interdisciplinary modules.

Where options were available, staff regarded them as valuable. For example, it was stated by one programme leader that options encouraged students to *"spread their wings in areas which are not core"*. Most school respondents liked the idea of options as empowerment for students that facilitated the widening of horizons. They regretted more were not feasible. The main constraints for providing options from which students might make a choice was said to be the demands of the RPSGB prescribed core curriculum on time. Another constraint that was mentioned frequently was staff resources.

"'I think that non-pharmacy options actually might be good, that's a personal thing, I think that's producing a rounded person who has knowledge outside the area. However the remit we have is to produce pharmacists with pharmaceutically related knowledge, so that's what we're doing". (Q12).

Students were also supportive of the concept of optional studies. Only 8% (n=57) considered that there should be no optionality (no element of choice). Similar numbers considered that options should be restricted to pharmacy related subjects (45%, n=335) or be a mix of pharmacy related and non-pharmacy subjects (40%, n= 298). A further 7% (n=50) considered that options should be restricted to non-pharmacy subjects. There was no significant association between the students' school and views on options.

3.2.6 Shared Curriculum

None of the schools had a major shared component of the curriculum with other degree courses. So they are relatively insular. Of the 16, 4 had no component of shared curriculum. Of the remaining 12, the majority (10) had some shared curriculum with other science programmes offered by the school. In these cases the shared components were early in the programme and there was no concern about any compromise in objectives for the pharmacy students. Two schools were sharing part of the curriculum with medicine and nursing. One had a significant component shared (pharmacology) and it was perceived that the size of the total group presented significant logistical problems. There was concern in this school over orientation of the material - recognition of the difficulty of meeting the particular needs of three different student groups. Another school had a course in medical ethics that was delivered to pharmacy, nursing and medicine students. Again numbers presented difficulties and the other major problem was the difference in experience of the medical students - the course was offered later in their studies at a time when they had started their major clinical work. Timing of the course for the different student groups had been identified as an important issue. Two schools had new inter-professional programmes in an early stage of implementation. Both recognised the logistical challenge.

3.3 Curriculum - Key Findings

1. Institutional teaching and learning strategies were not a major factor influencing curriculum design.
2. The primary external influence on curriculum design was the RPSGB accreditation requirements.
3. There was greater awareness amongst key staff of the indicative syllabus than of the criteria for accreditation.

4. Although the majority of school respondents recognised the QAA benchmark as an external influence on curriculum design, this was viewed differently to the RPSGB accreditation requirements - more of a hurdle to meet rather than a driver for change.

5. Although there was some awareness of changes in other health professions and in the NHS, these did not emerge as major curriculum drivers.

6. A minority of schools had external steering groups or formal consultation mechanisms with the profession and employers.

7. There was very little interaction between schools and the RPSGB about the interface between the degree programme and the preregistration training year. Schools relied upon ad hoc sources of information about the preregistration year and there was an absence of any robust link between the degree programme and preregistration training.

8. All schools were aware of recent policies in relation to widening participation and disability but at the point of the study, these had not influenced curriculum. Special provision was made on an individual student basis and affected teaching and learning rather than curriculum, although there were concerns over the lack of any clear policy in relation to registration.

9. The management of the curriculum in schools varied but a common factor was an identified programme leader. The majority, but not all, schools had a formal curriculum review group with representation across the curriculum.

10. Schools were not subject to any significant internal institutional constraints on curriculum design and delivery. All had considerable flexibility within their institutions to introduce special regulations or to change normal procedures where this was occasioned by professional needs.

11. All but two schools had seen significant growth in student numbers since the advent of the MPharm degree. This had not affected curriculum but it had significantly affected methods of delivery and assessment.

12. Of the 16 schools, 13 had a clear modular structure. Only 2 schools were working to the European Credit Transfer Scheme (ECTS) and changes will be needed if UK schools are to meet the requirements of the Bologna Declaration.

13. On average, the curriculum is equally divided between the main subject areas of pharmacology, pharmaceutics, medicinal chemistry, clinical pharmacy/therapeutics and pharmacy practice.

14. There is a high degree of consistency in the curricula within the 16 schools which reflects a successful accreditation process by the RPSGB.

15. Total contact hours average 1544 across the 16 UK schools.

16. Directed student learning makes a significant contribution to the overall student workload in schools (average 49% across 15 schools for which data was available).

17. UK pharmacy programmes have a strong science base which on average accounts for just over half the total curriculum time. On average, just under a third of curriculum time is in the area of practice or clinical with the remainder accounted for by the research project, optional studies and skills.

18. Just over a half of UK final year students who completed the student questionnaire considered that the time devoted to pharmaceutical sciences was about right, although about one third considered it to be too much.

19. When asked whether the science content was necessary as a base for professional studies in the latter parts of the degree, the distribution of responses was very similar to those on the appropriateness of the science content, with just over 50% agreeing and just under one third disagreeing.

20. Over 70% of students considered that there was not enough material relevant to pharmacy practice within the first year of the course.

21. The vast majority of students considered that pharmacy practice and clinical pharmacy should be taught in all years of the MPharm.

22. Across the sector, there is little optionality within the MPharm courses and 5 schools have no choice at all. In contrast students favoured choice.

23. None of the schools had a major shared component of the curriculum with other degree course(s) and only 2 shared clinical teaching with nursing or medicine. The most common form of shared curriculum was with other science programmes.

4. Teaching and Learning

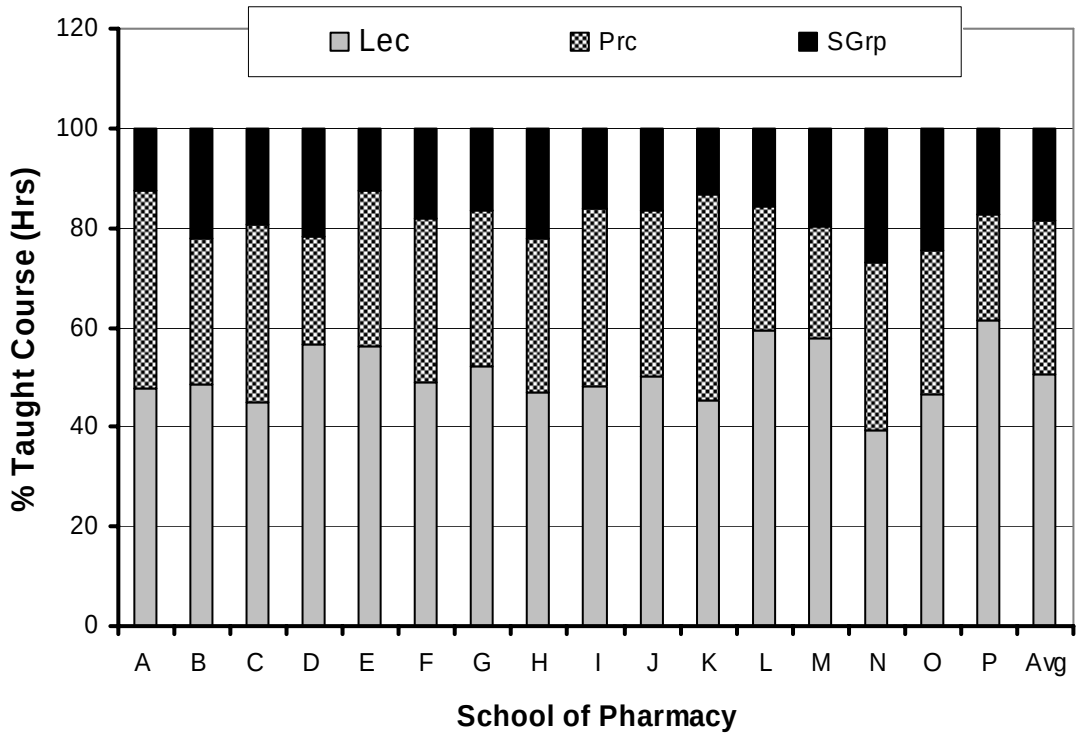
4.1 Methods

4.1.1 Balance of Teaching Methods

In all schools this was the responsibility of the individual lecturer and of the course/module leader. In most schools there was a review process (teaching committee or similar) that looked at the broad balance across the whole of the programme and that had to approve major changes. Many respondents commented that there was an expectation that didactic teaching would progressively reduce through the programme and that in parallel; there would be a progressive increase in the emphasis upon the students self-learning. This was generally an unwritten view rather than a policy and was not supported by the data analysis (see below).

Analysis of the data supplied by the schools showed that overall, around one half (51%) of the taught element of the course was delivered using lectures, a further 31% was in the form of practicals and 18% was in the form of small group or interactive teaching (seminars, workshops, tutorials etc). In making this calculation, computer aided learning sessions have been included within the practical element since this is how they are normally returned by schools during accreditation. The data for individual schools and the sector average is shown in Figure 4.1 below.

Figure 4.1: The taught curriculum in UK Schools of pharmacy, shown as lecture (Lec), practicals (Prc) and small group/interactive sessions (SGrp).



The published data from schools showed that on average there was no reduction in taught hours over the four years of the programme although in most schools the project made a significant contribution to the hours count in the final year. The average for taught hours across the 15 schools for which adequate data was available is summarised in Table 4.1 below. There was a high degree of uniformity across schools for the first three years of study. Most of the apparent variation in the final year was due to differences in the number of hours included in the taught hours in relation to the final year project.

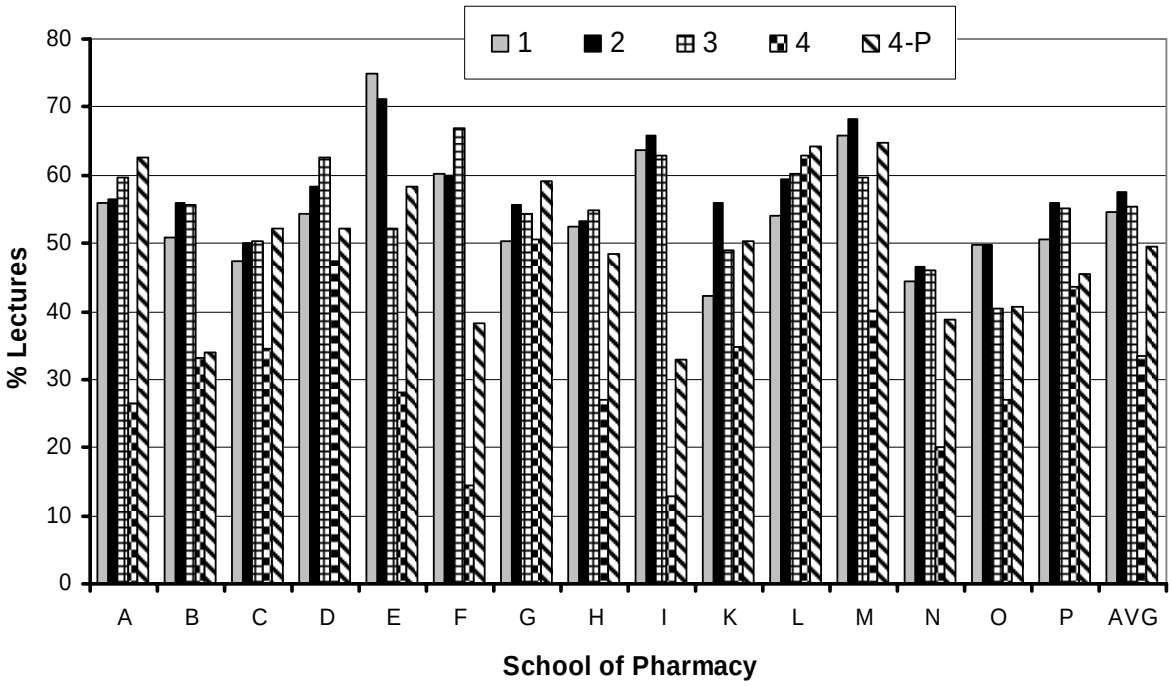
Table 4.1: Average hours per year for 15 UK Schools of pharmacy

Year of Programme	Average Contact Hours	Range
1	408	373-466
2	401	356-460
3	387	297-413
4	401	274-519

4.1.2 Lectures

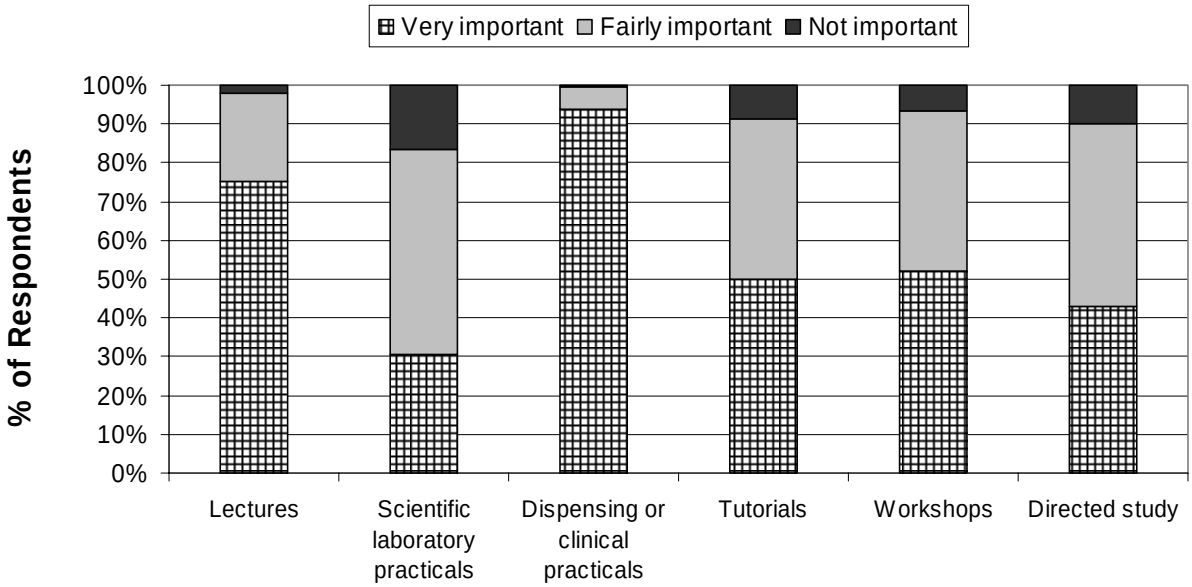
On average, lectures formed the largest part of the overall course. Figure 4.2 shows the proportion of each year of the course that was in the form of lectures. Data is shown for each school and for the sector average. The final year proportions have been calculated in two ways - as a proportion of total taught hours and as a proportion of the total taught hours minus projects. In general, the final year project contributed a significant component of the final year yet involved little or no lectures. It can be seen that over the first two years the average contribution of lectures was 55% (first year), 58% (second year) and 55% (third year). In final year, lectures contributed 34% of the taught course including projects but 49% excluding projects. As with total hours, therefore, the data on lectures does not support the belief of staff that the course became less didactic towards the final year.

Figure 4.2: Percentage contribution of lectures to the taught components of the MPharm course shown by year of the course (1, 2, 3 and 4) and for the final year discounting the project (4-P). AVG denotes the sector averages.



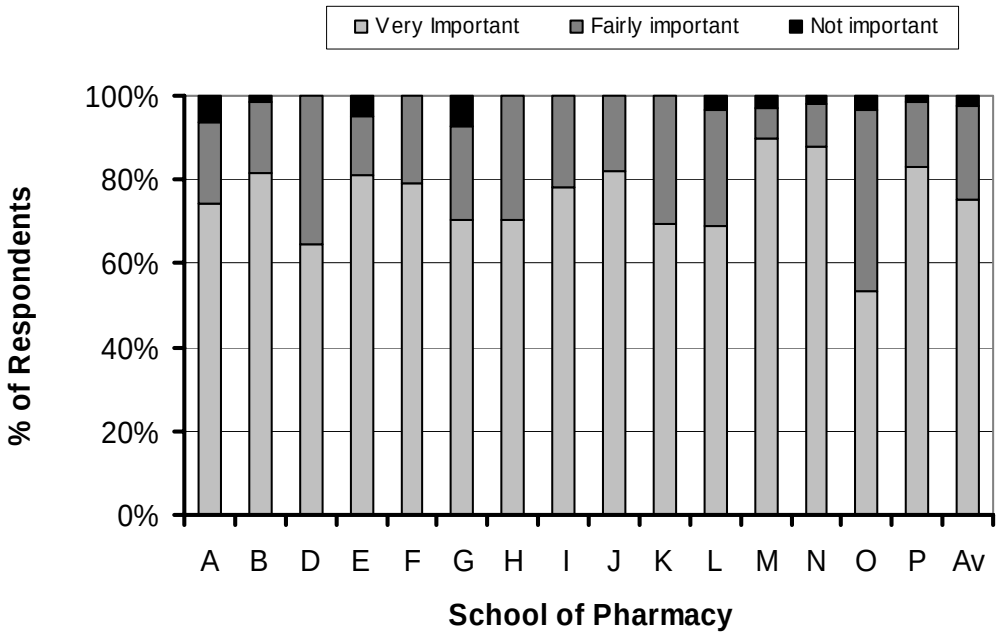
The survey of UK final year students showed that students perceived lectures to be the most important method of teaching after dispensing or clinical practicals. 75% (n=558) of students rated lectures as very important with only 2% (n=16) who rated them as not important. Most (94%, n=694) students rated dispensing or clinical practicals as very important. Analysing those sessions rated as very important, dispensing or clinical practicals and lectures were followed by workshops (52%, n=386), tutorials (50%, n=369) and directed study (43%, n=318). Scientific laboratory practicals were rated the lowest, with only 31% (n=227) of students rating them as very important. It should, however, be noted that all teaching methods were rated at least fairly important by 80% of respondents. These results are shown in Figure 4.3.

Figure 4.3: Perceived importance of a variety of teaching methods by UK MPharm students (n=741).



Analysis of the results by school indicated that there was some difference between the levels of importance given to lectures across the 15 schools, but students from all schools rate the importance of lectures highly. Proportions of students stating that lectures are very important (n=741) ranged between 54-90% (Figure 4.4). It is interesting to note that the school in which the lowest proportion of students considered lectures to be important is the school that had a highly developed system for student centred learning with extensive provision of lecture support material. Therefore students' views on the importance of the various teaching methods may well reflect their experience.

Figure 4.4: Perceived importance of lectures by final year UK pharmacy students. Results are shown by school of pharmacy (A to P) and for the whole sample (Av) (n=741).

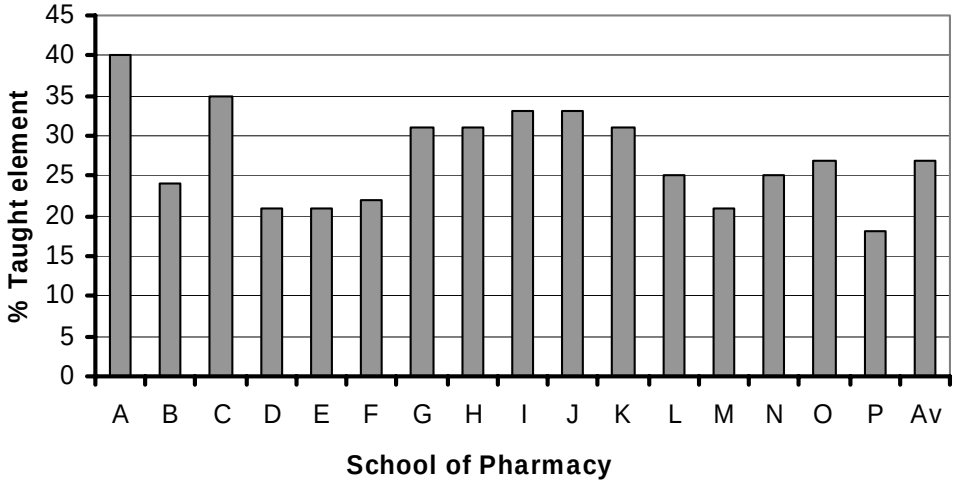


4.1.3 Practicals

There is an RPSGB accreditation requirement, derived from an EU expert committee recommendation, that at least 35% of directed study involves practicals or student involvement in the analysis of data. We were therefore interested in how schools defined practical work. All schools included a wide range of teaching methods in the calculation of total practical hours. Several respondents commented that laboratory practicals (wet practicals) were decreasing - particularly in pharmacology where large group sizes and increasingly restrictive legislation were having a major impact. However, there was general recognition that laboratory based practicals were distinct from other forms of coursework that might be classed as practical for the purpose of the EU directive. Therefore while in most schools workshops, CAL classes, interactive seminars and student-lead learning sessions were all classed as practical for the purpose of accreditation, respondents recognised the importance of trying to maintain "hands-on" laboratory classes to support the underpinning sciences.

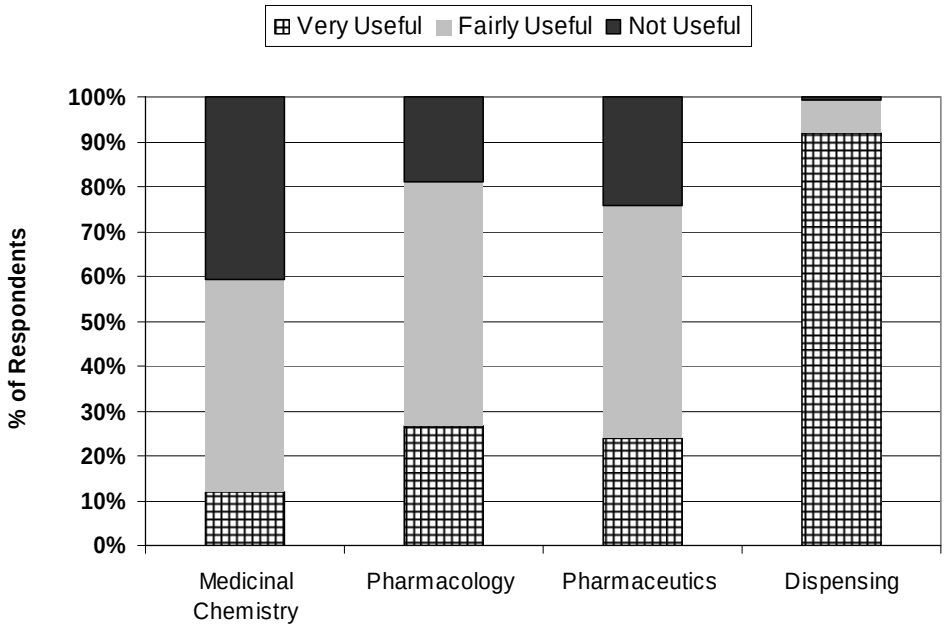
Analysis of the data supplied by the schools shows a wide variation in the proportion of the taught course that was devoted to laboratory based practical teaching. Overall, just over one quarter (27%) of the taught element of the course was delivered using practical teaching. This ranged between 18% and 40% (see Figure 4.5): equivalent to a range in contact time of 282 hours to 657 hours.

Figure 4.5: Percentage of total taught hours that are delivered by laboratory-based practicals in UK schools of pharmacy.



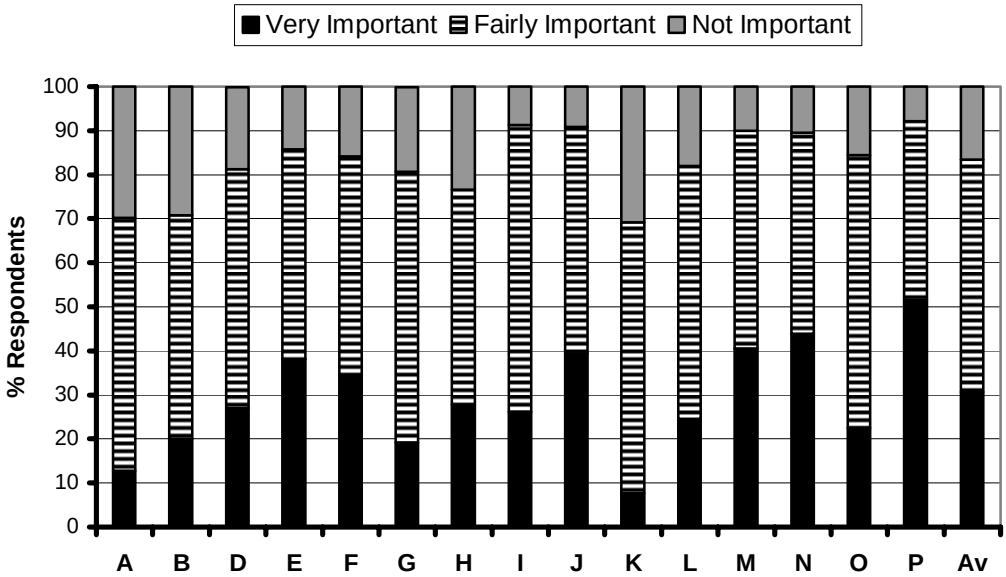
The survey asked students (n=741) to rate the usefulness of their practical classes within the four main teaching areas. Dispensing practicals were rated the most useful with 92% (n=680) of students rating them as very useful. Practicals in other areas were much less valued. When looking at the numbers rating as very useful, dispensing practicals were followed by pharmacology practicals (27%, n=198), pharmaceutics practicals (24%, n=177) and finally medicinal chemistry practicals (12%, n=88). However, 41% of respondents (n=302) stated that medicinal chemistry practicals were not useful (Figure 4.6). These student views contrast with the staff priorities in trying to maintain the practical base and with the accreditation requirements. However, the student views may be influenced by perceptions of the learning derived from classes and its application. There is some evidence that this may have influenced views on lectures (see above) and there is strong evidence of the focus of the pharmacy curriculum upon knowledge. In this context, students may themselves focus upon knowledge rather than the wider skills derived from practicals. Dispensing is clearly different and here views are likely to be influenced by perceptions of relevance. Further study of the learning aspirations of students and their engagement with various forms of learning and teaching is called for.

Figure 4.6: Perceptions of final year UK MPharm students as to the usefulness of practical teaching within different teaching areas.



Students were also asked to rate the importance of science and dispensing/clinical practicals for their personal learning (Figure 4.7). Across the whole sample, 30% considered scientific laboratory practicals to be very important (range 8-52%). The school where practicals were rated highest was the one with the largest contribution of coursework to the overall assessment of students (see chapter 5). Conversely, the school with the lowest proportion rating highly was the one with the largest science component running through the four years of assessment. This provides support for the suggestion that student views of value are influenced by derived benefit and perceived relevance.

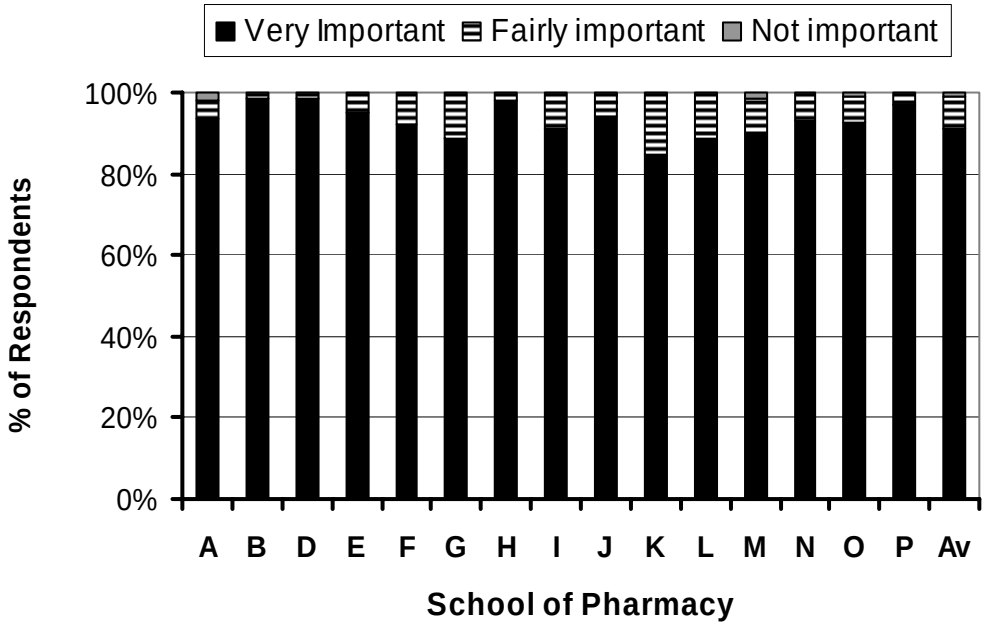
Figure 4.7: Perceptions of final year UK MPharm students as to the importance of scientific laboratory practicals. Shown by school of pharmacy and as the average (Av) for the whole sample (n=741).



In contrast, there was much less variation between schools when students were asked to rate the importance of dispensing or clinical practicals (Figure 4.8). Across the whole sample (n=741), 91% of respondents rated these as very important (range 85-99%). Only 3

respondents (0.4%) rate these practicals as not important. These students were from different schools.

Figure 4.8: Perceptions of final year UK MPharm students as to the importance of dispensing/clinical practicals. Shown by school of pharmacy and as the average (Av) for the whole sample (n=741).



4.2 Student Centred Learning

4.2.1 Student Centred Learning

All the schools that had modularised degree programmes recognised three components of student workload - time in formal taught session, time in directed study where there is a clear specification of the learning outcomes and self-study. The term “student centred learning” is also used to describe directed study where there is no formal staff engagement. Respondents from the schools stated that none of their institutions had any policy on the amount of student centred learning to be included in a programme - this was left to individual programmes. In schools with modular programmes, there was a credit definition linked to total student effort and in the majority, there was an institutional view of a maximum taught component. All school respondents stated that student centred learning was encouraged, and several indicated an expectation that this should increase over the four years of the programme. However, in the majority of schools there was no limit on the proportion of self-learning although three schools had broad guidelines for the amount of directed study to be included in a module. In all schools the responsibility for the definition and form of student centred learning was devolved to individual teaching staff and module/course leaders.

Student centred learning can allow opportunity for innovation in learning approaches. However, there was clear evidence (see curriculum, page 27) that directed study formed a very significant component of the pharmacy curriculum. Definition of volume therefore becomes a matter of importance in overall student workload and is relevant to student perceptions of workload (see below).

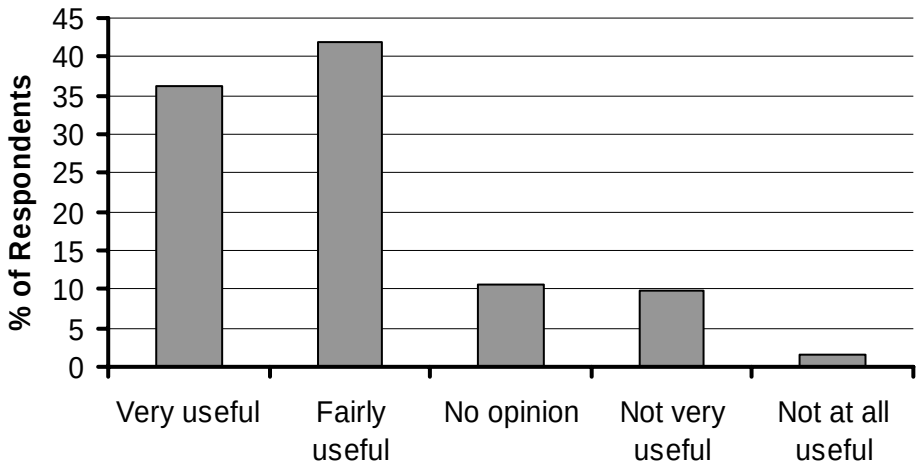
4.2.2 Support for Student Centred Learning

A variety of approaches were seen in the approach of schools to the support of student centred learning. Most schools provide library skills, often through the specialist library staff. Six of the

schools made specific mention of IT support either through virtual learning environments (VLEs) or through specific computer aided learning material (CAL). Three schools had extended or modified the personal tutor system in the first year to support skill development. One had structured "academic tutorial groups" that were tied to skill development and to inculcation of the skills needed for self-learning. Assessment of the directed material was generally through either tests (formative or summative) or examinations.

A majority of the student responses in the survey (n=739) showed support for the use of an intranet or virtual learning environment: 78% (n=577) considered access to learning materials on an intranet or virtual learning environment has been either very or fairly useful (Figure 4.9).

Figure 4.9: Perceived usefulness of access to learning materials on an intranet or virtual learning environment (VLE) by final year UK MPharm students.



Students were also asked their opinion as to which method(s) they would prefer for (a) the delivery of new material and (b) for the support of their learning of new material. In both cases, a majority of students (73% and 74% respectively) indicated their support for a combination of both IT and traditional lecture (Table 4.2 below).

Table 4.2: Preference of Final Year UK MPharm students in schools on the use of IT and/or lectures for the delivery and learning support of new material.

Purpose	IT	Both IT and traditional lecture	Traditional lecture
Delivery of new material (n=740)	3% (n=24)	73% (n=539)	24% (n=177)
Learning support of new material (n = 740)	12% (n=88)	74% (n=551)	14% (n= 101)

4.3 Deep Learning and Problem Based Learning

4.3.1 Deep Learning

The distinction between deep and shallow learning was first made by Marton and Säljö in 1976[24]. It describes a fundamental distinction between two study intentions: a shallow approach where the intention is to memorise material or to reproduce it (also referred to as surface learning) and a deep approach where there is an intention to make sense and explain it. Deep and surface approaches are not considered as fixed traits or learning styles and there is research that demonstrates students will adopt either according to the approach and the material[53]. Approaches that encourage surface learning are high syllabus volume and high assessment load. This study has demonstrated that both apply to current undergraduate pharmacy education in the UK and that students consider the workload high (see 4.5 this section). Consequently there is a danger that students will adopt a surface learning approach.

Our data is drawn from the interviews with staff in the schools. The majority of the schools (14/16) recognised the importance of deep learning. In all cases the view was positive and in the majority, the approach was aspirational.

"Policy I would say no, aspirations I would say yes". (Q13).

"I wouldn't say policy. I think there's a great awareness between the majority of staff, especially when we're defining learning objectives a lot more distinctly and precisely than we used to do". (Q14).

One school had a clear strategy for development of deep learning that was phased over the duration of the MPharm degree. Both respondents from this school were well informed on the educational theory surrounding deep learning and it was notable that this school had a well developed research interest in education. Most respondents from other schools clearly associated deep learning with student centred learning and several explicitly mentioned student centred learning as a way of encouraging deep learning. Respondents from three other schools described a learning strategy within their schools to move from didactic learning to student centred learning between the first and final year. In each case the aim was to develop self-learning skills in the later part of the programme. However, none had formal implementation policies and implementation was left to individual staff and module leaders. Generally the way in which individual modules developed deep learning was left to the module providers.

"Yes, more didactic at the beginning, more student centred towards the end - that's what we would like to do". (Q15).

A number of approaches to deep learning emerged. One was the use of learning objectives to demand deep learning. Several respondents mentioned the use of assessments that demand the qualities that underpin deep learning - ability to analyse, be critical and demonstrate understanding. In response to a question as to whether the school had a policy on deep learning, one respondent replied:

"Only through assessment really. We expect students in their later stages to delve further into things; hence we give them less guidance". (Q16).

4.3.2 Problem Based Learning (PBL)

Problem-based learning (PBL) was popularised in the 1960s as a result of research into the reasoning abilities of medical students[19]. The drive for this research was a desire to develop in medical students the ability to relate the knowledge they had learned to the problems with which the patients presented, something the researchers had found few medical students able to do well. Essentially, PBL is an instructional method that challenges students to "learn to learn". It involves co-operative working in groups to seek solutions to problems with the problems being used to engage students' curiosity and initiate learning the subject matter. The expectation is that students learn to think critically and analytically, and to find and use appropriate learning resources. In educational terms, a clear distinction is drawn between PBL and problem solving learning - the latter presents students with problems with the expectation that they arrive at pre-set answers. With PBL there is no set of pre-determined answers - rather through engagement with complex ideas and issues, students develop their understanding.

We asked staff about the use of PBL within their school. The difficulty in terminology was well recognised and a further complication was communication within the school. It was apparent at times that the respondents were unsure as to whether certain activity was really PBL as opposed to problem solving. All schools employed problem solving exercises (problem solving learning) and a distinction was drawn between this approach (often referred to as "problem based teaching") and problem based learning as it has been developed in the medical curriculum. This distinction is exemplified by the following quotation:

"We haven't gone as far as PBL but what we are trying to do is to create an environment where the students can get problems and can go and do things - but we don't facilitate it in a PBL manner. We don't construct the learning experience in the way that a true PBL would". (Q17).

There was awareness of PBL in the medical context and of the resource implications. One school in a university with a medical school pointed out the difference between the "problem based learning" approach in pharmacy and that in medicine - the term "case based" learning was used in relation to pharmacy. However, this again emphasised the difficulty with nomenclature in this field since one of the most common approaches to PBL is the case based approach first developed at Harvard.[20]

"I think what we run is case based learning, medicine here run their course entirely on PBL, we've no intention of going down that line". (Q18).

Five of the sixteen schools visited considered that they used PBL in its full format - but in all cases this was for a limited number of modules and in three for only one module. Where used, it was regarded as successful, demanding on students and on resources. Several respondents commented on the up-front investment needed.

"It's very front loaded in terms of investment in time and effort which is why I suspect that we won't go whole heartedly down that route but I do think it's an important theme, a strand if you like, that needs to run through the four years of the programme". (Q19).

In contrast, all respondents were positive towards the concept of PBL. The major limiting factor was resource and several contrasted the differing funding levels in medicine, where PBL is probably most firmly established, and pharmacy. There were also some comments on the difficulties of convincing some staff of the value of the approach particularly in view of the time needed as an initial investment. These findings suggested that there would be value in a more detailed exploration of what is happening in PBL to determine the precise approaches being used. It is possible that this would be of value to the whole academic community in pharmacy since a shared approach might be the best way to minimise the overall time investment needed.

4.4 Learning Outcomes: Knowledge, Skills and Attitudes

4.4.1 A Knowledge, Skills and Attitudes Framework.

Most modular degree schemes now separate learning outcomes in terms of knowledge and skills; usually with latter sub-divided into generic and subject specific skills. For health professionals, there has been a growing recognition of the importance of appropriate attitudes and beliefs (see introduction). However, these are more difficult to define and present a significant educational challenge. In its final report, the Pharmacy Education Research and Development Reference Group recognised the importance of professional attitudes and recommended that the RPSGB should lead the development and adoption of a comprehensive knowledge, skills and attitudes (KSA) framework for pharmacy. Knowledge requirements have been defined for many years in the accreditation document and we were therefore interested in the views of school respondents on the two less clearly defined elements of this triad - skills and attitudes.

There was general support for the development of a KSA framework for pharmacy provided that it was indicative and not prescriptive.

"Yes I can see that [the value], along the lines of the indicative syllabus, that these are the skills and attitudes which we would expect a pharmacist to have. I'm sure we do it but it's nice to have a reference point". (Q20).

Respondents from two schools were strongly against the concept of a KSA framework. However, detailed analysis of the transcripts suggests that this might be because these respondents had interpreted the framework as a prescriptive national requirement. In this

respect, the majority of respondents expressed concerns about an additional set of requirements. In contrast, views in one school were supportive of a framework that was prescriptive since it would provide a national guide to good practice and so encourage all schools to meet minimal standards. The support for a framework was in the context of a statement of minimal requirements that still left scope for individual variation.

Several respondents raised the issue of assessment of skills and of the difficulty of setting objective measures. Speaking of the value of a KSA framework for pharmacy:

"I think it would be useful, the one thing might be that it is very difficult to assess skills unless you're in a practical situation like a preregistration post". (Q21).

"It might be useful from an indicative stand, I'm not quite sure how you would measure it or what you would do if you found that you didn't have it at the end of the four or five years". (Q22).

The continual nature of skill development and the need to look at the whole educational process for pharmacy was mentioned by several respondents.

"The NHS now is being forced into a gentle change where people are going to be paid on their competence, what they can actually do, and we can't leave developing these skills until the prereg year. We have to make a contribution, I think". (Q23).

The broader educational role of higher education was raised by one respondent, who whilst supportive of a KSA for pharmacy, argued that education was not just training for future pharmacists.

"I think it's important that we do have a broader sense of the profession and what we are educating these students for, but we have to accept that education is beyond entering the profession. I think from our point of view, we are not just training future pharmacists, we have to look at their broader education". (Q24).

4.4.2 Current Views on Desirable Attitudes

Respondents were asked about the attitudes they would like to develop through their programme. The most common response was professionalism and a list of qualities that contributed to professionalism in a health context (e.g. caring attitude, honesty, integrity, thoughtful of others).

"Professionalism is one, which involves things like honesty and a scientific approach". (Q25).

Several respondents mentioned that the intention was to develop a professional attitude throughout the programme. Others mentioned attitudes to education such as enjoyment in learning. Most considered that attitudes were difficult to define and even more difficult to assess. In general, respondents had difficulty with this question and responses indicated that there had been less consideration of attitudes than of knowledge and skills.

"That's a good question. I think in the OSCE we assess some of the attitudes and stuff but I'm not sure whether it's laid down anywhere". (Q26).

Two respondents stated that there was no definition of the attitudes that were developed and in both cases there was suspicion of external regulation.

"Yes, they aren't. We don't have a School motto which is recited every morning. There are statements within the student handbook for instance, as to what we expect of students in terms of them developing educationally in a way that will support a professional activity in the widest sense". (Q27).

Whilst attitudes were a small element of the present study, the responses suggest that this is an area needing further research.

4.4.3 Generic Skills

Respondents were asked how they developed generic skills across their programmes with specific questions about communication skills, interpersonal skills, quantitative skills and management skills (e.g. influencing skills, time management). All respondents were aware of the importance of skills to complement knowledge and several schools had undertaken a full skill map across the programme.

Half the schools (8/16) had formal skills modules - in most cases in the first year but in some cases throughout the programme. In all cases skills were also embedded within other modules. In schools without formal skills modules, there was development of skills within core modules. There were some interesting examples of alternative approaches. Two schools used the personal tutor system to develop skills - in one case supported by formal teaching (e.g. on psychology of communication). Another school had given responsibility for key skills to different teaching teams - for example medicinal chemistry focussed upon written skill development. In general the key generic skills were all recognised as important and were clearly articulated in learning objectives. This is supported by the high scores achieved by all schools in the subject reviews conducted by national higher education councils. Subject review placed considerable emphasis upon acquisition of generic skills and upon robust methods to assess their attainment.

Management skills were less clearly addressed in schools - in some cases not at all (5 schools) and at best only in terms of time management. One school had involved the university English department in a first year course on writing skills.

4.4.4 Preparation of Professionalism - CPD

Respondents were asked how their school prepared students for the need to self-learn. Eleven of the 16 schools used some form of portfolio or log book that students maintained to demonstrate their learning. All had some check on this but not all included a mark in the formal assessment process. Four of these schools involved personal tutors in review of the portfolio/log book. All schools require students to undertake self directed learning and several respondents pointed to this as a mechanism of developing self-learning skills. Several respondents also referred to taught sessions on CPD - often with repeated mention throughout the programme. One school used a portfolio approach in pharmacy practice that was sequenced over the four years of the programme and supported this with a reflective prescribing portfolio for the clinical components of the programme in years three and four.

4.5 Student Perceptions

4.5.1 Workload

Final year students were asked about the volume of work required for the MPharm course. The majority (63%, n=465) considered the workload to be about right and about a third (34%, n= 253) considered it to be either too much or far too much. Only 3% (n=19) considered that it was either not enough or nowhere near enough.

A broadly similar distribution in responses was obtained when students were asked how difficult they found it to cope with the amount of work. The majority (56%, n=415) considered it to be about average whilst just over a third (40.5%, n= 299) chose “difficult” or “very difficult”. Only 3% (n = 24) considered it to be either “easy” or “very easy”.

4.5.2 Knowledge/Skills Balance.

Final year students were asked about the balance between knowledge and skills in their MPharm course. The results are shown in Table 4.3. A total of 741 responses were received from UK students with 5 not answering this question.

Table 4.3: Responses of students to the statement "I think the balance of the MPharm course is adequately described as" (n=741).

Option	% Choosing (number)
Far too much of a focus on pure knowledge	6% (44)
Too much of a focus upon pure knowledge	51% (377)
About right	40% (294)
Too much of a focus on relevant skills	3% (20)
Far too much of a focus on relevant skills	0.1% (1)

4.6 Key Findings

1. In all schools, the individual teachers and course/module co-ordinators determined the choice of teaching and learning methods to be used.
2. There was a general expectation by programme leaders that the proportion of didactic teaching would decrease over the four years of the programme, although in the majority of schools, this was an unwritten policy.
3. Lectures were the main method of teaching accounting for an average of 51% of taught time across the sector. Students considered the lecture to be the most important method of teaching for their learning.
4. After lectures, practicals accounted for the second largest component of time: an average of 27% of total formal teaching. Students considered dispensing and clinical practice as very important for their learning but science practicals were less highly regarded with only 31% of students rating them as very important for their learning.
5. The majority of students (92%) considered dispensing/clinical practicals to be very useful but less than 30% considered this of practicals in pharmaceutics, pharmacology or medicinal chemistry. Medicinal chemistry was considered the least useful - 12% rated practicals in this subject as very useful.
6. None of the schools had a formal specification for student centred learning and only 2 schools had any formal policy on the volume for inclusion in course/module units. Specification and design of student centred learning was largely left to individual teachers and course/module co-ordinators.
7. Schools used a diverse range of methods to support student centred learning including personal tutors, various forms of IT (including VLEs) and academic groups.
8. A majority of students found IT support to be useful as a support for their studies although few supported the use of this medium alone as a basis for learning.
9. Respondents from all the schools were aware of the concept of "deep learning" and all supported its attainment.
10. Respondents for all the schools were aware of the concept of PBL and all were supportive of its ideals. All schools were running learning based on problem solving but it was less clear as to the extent of full PBL. Six of the 16 schools claimed to use PBL but only for the delivery of parts of their curriculum and in most cases, only for isolated modules. Resource (financial and staff) was considered a major issue in its extension.
11. Most respondents were supportive of the concept of knowledge, skills and attitudes (KSA) map for pharmacy provided that it was indicative and not prescriptive. More work is necessary to define pharmacy specific professional attitudes.
12. Respondents from all schools recognised the need to develop an awareness of the needs for professional CPD and the most common method was through completion of a learning portfolio (11 of the 16 schools).

13. A majority of students perceived the overall workload on their programme to be about right but one third considered it to be too high. A slightly higher proportion (40%), considered that they found it difficult to keep up with the work.

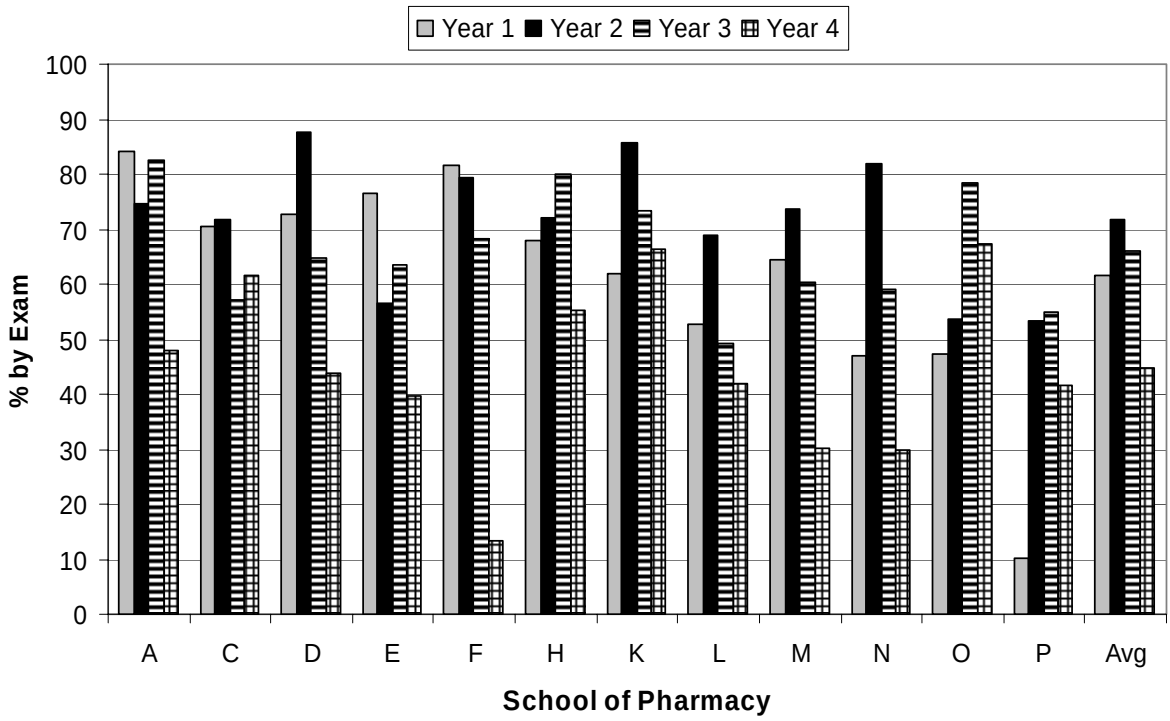
14. A majority of students (57%) considered that their programme had too much focus on knowledge in comparison to development of essential skills.

5. ASSESSMENT

5.1 Methods

In all but one of the sixteen schools, examinations were the principal form of assessment in the first three years of the programme. However, in one school, institutional policy meant that there were no examinations in the first year of study. Complete data on assessments was available for 12 of the 16 schools. For this group, examinations accounted for an average of 66% of the total assessment load during the first three years of study. In all schools, examinations contributed less to the assessment load in the final year. In the 12 schools for which full data was available, an average of 44% of the final year assessment was derived from examinations but there was a large range - from a minimum of 13% to a maximum of 67%. One factor that underlies this range is the contribution of the final year project to the assessment. For example, the school with the lowest contribution of examinations had the highest contribution from the research project (50% of the final year mark). The contribution of examinations to the overall assessment in each year of the programme is summarised in Figure 5.1 below.

Figure 5.1: Contribution of examinations to the overall assessment in each year of the degree programme in twelve UK 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 the majority of institutions the final year is the major contributor.

A variety of approaches were taken to the assessment of coursework. The most commonly used were written work (such as reports, written exercises and critiques), continuous assessment, class tests, assessed labs and practical reports. Written work and laboratory work tended to make up the majority of the assessment, particularly in early years of the programme. Presentations and OSCEs featured more highly in the latter years, along with the research project/dissertation. Interactive assessments such as video recorded interactions and OSCEs were used by 8/16 schools and 9/16 schools respectively. The interviews showed that the term OSCE was widely interpreted - some were the traditional clinical assessments whilst in some schools they were practical based and linked to dispensing skills. Thirteen schools used peer

assessment; all used group work. It is interesting to compare these assessment methods with the school respondents' views on the key attitudes that they wished to engender (see section 4.4, page 43). A key question is the extent to which professionalism is an attitude or behaviour. The majority of the assessment methods employed were directed at behaviour or practical competence rather than attitude.

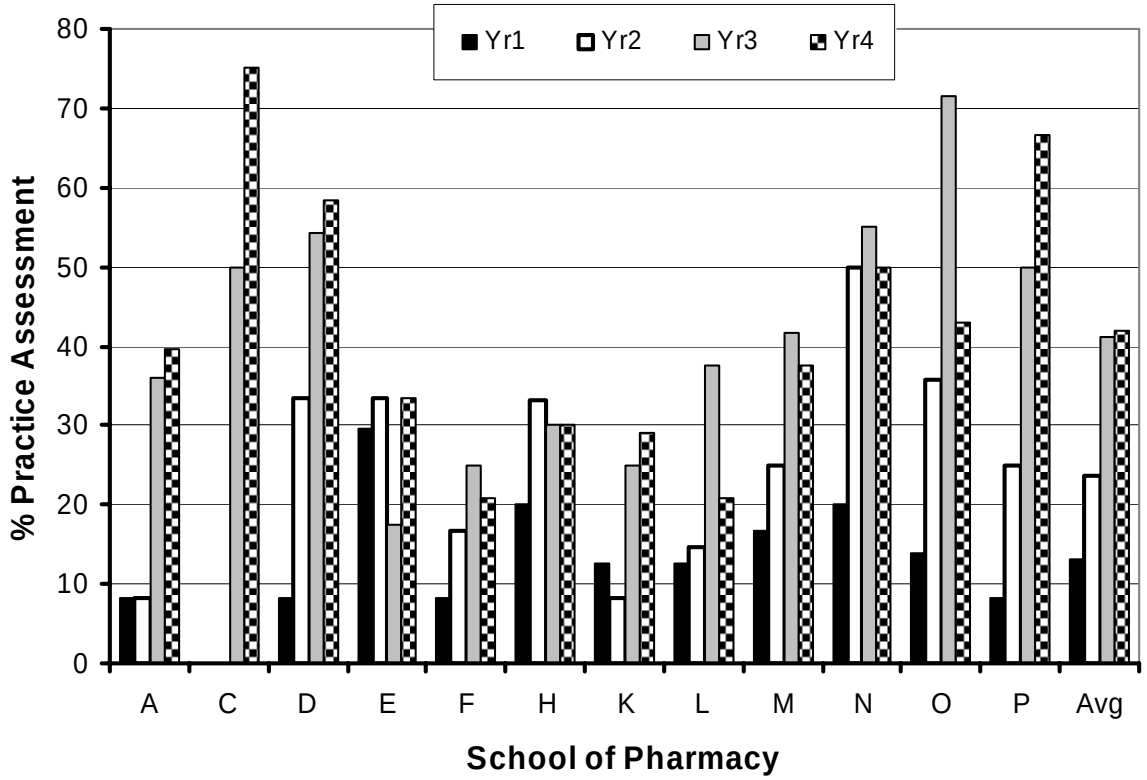
A majority of the students surveyed considered that the balance between examinations and coursework was about right (67%, n=498) with 27% (n=198) considering that the balance was too far weighted towards examinations. However, it was interesting that students appeared to distinguish between the form 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, a majority agreed (57%, n=421) with a minority considering that the balance was about right (40%, n=290).

5.2 Practice and Science

In the majority of schools (13/16), the programmes were front-loaded with science (see section 3.2.3, page 27) and conversely, the practice/clinical elements built towards the end. In the other 3 schools there was a deliberate policy to integrate the teaching over the four years of the programme.

The proportion of the total assessment in each year that was derived from practice is shown in Figure 5.2 below for the 12 schools for which complete data was available. The remainder of the assessment derived from science or activity that could not be classified as either practice or science e.g. skills, options or project.

Figure 5.2: Contribution of assessments in pharmacy practice (clinical and practice) to the overall assessment in each year of the MPharm programme for 12 UK schools (A to P) and the Sector Averages (Avg).



Frontloading 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. Figure 5.2 shows that on average, the practice contribution rose from

around 13% of the total in year 1 to 42% of the total in year 4. There were marked differences between schools in the proportion of each year that derived from practice compared with science. However, for each school the relative assessment loadings for science and practice closely matched closely the proportions of these two areas to the taught course (see page 28).

Considering the 12 schools for which complete data was available, the final year contributed on average 58% of the final degree mark (range 40-70%). Calculation of the percentage contribution of practice over the entire degree to the final class gave a range from 21% to 63% with an average of 40%. Currently the method of calculation of the final degree and the contribution of individual elements of the programme of study are not covered by the RPSGB accreditation requirements. In the interests of equity and to ensure comparability this is an area that may warrant further consideration.

5.3 Professional (Clinical) Competence

Respondents from the schools had difficulty in defining competence to practice in relation to the undergraduate programme. Several expressed the view that they were uncertain of what the necessary competencies were and there were concerns about the lack of definitions.

"I think its probably within the group we have an idea of what competence is - although if you are saying is it formally decided or written down anywhere then no, I don't think it is". (Q28).

"I don't think anyone has to be honest - and what we have to do is, I think, in the profession agree about levels of practice". (Q29).

It was clear from responses to the school interviews, that currently the assessment of professional competency is heavily focussed upon competence in dispensing and pharmacy law and ethics. This was a reflection the RPSGB accreditation requirements. There are only two specific requirements relating to student competence (48 and 49). However neither provides a definition of competence. Competency 48 refers to an "assessment of competence in dispensing" and 49 states that "there is a requirement for achievement of satisfactorily high standards in assessments of both dispensing practice and pharmacy law and professional requirements".

"It's hard because there's no robust way to measure it, it's a value judgement I think. I think it could be assessed but I think we would have to go down the road of these structured objectives assessments". (Q33).

A concern raised by several respondents was that teaching took place in an artificial "non-practice" environment. This was perceived as a barrier to the assessment of professional competence.

"They would have to exhibit a certain level of competence in clinical areas but we don't specifically assess them in situ which the purist would say you can't measure competence unless you're actually in the field". (Q30).

One respondent went further and stated that it was simply not possible to assess competence within the current course structure because of the lack of articulation with practice within the degree.

"Yes, but I think we haven't got a hope of doing that under the present structure. I think its something we would consider under an ideal world but I don't think given the way the course is funded we're going to be able to measure clinically competent individuals". (Q31).

Several respondents referred either directly or indirectly to clinical knowledge and its applications. There were references to the use of objective structured clinical examinations (OSCEs). Many schools used these, or variations on these, but again there was no national standard on either the structure, the format or the expected achievements.

A number of respondents pointed out that the award of the degree is not the certification to practice and this makes pharmacy different from several other health professional courses. This

raises a question as to the extent of the University's responsibility to assess practice competence.

"They're only competent to a certain level and within a year group there will be different levels of competence, but none of them are clinically competent to act as a pharmacist by the time they finish our degree. They're competent to start their prereg". (Q32).

These comments reflect dissonance between the degree course and the professional preregistration training that also emerged in other parts of the interview (see section 3.1.4, page 23).

5.4 Current Practice Assessments

5.4.1 Dispensing

About half (7) of the schools assessed dispensing in year 3, two assessed it in year 2 and a further 2 ran the assessments over years 2 and 3. Three schools ran the main assessment of dispensing in the final year although one of these was planning a move to third year. One school ran an assessment of dispensing through all four years of the programme with a number of different assessment methodologies. In all cases, practical dispensing examinations or tests played some part in the assessment of dispensing competence and in the majority of cases this was the primary means of assessment. There was some indication from respondents that dispensing was regarded as of decreasing importance and relevance.

"I'd rather it was taught as a risk management process because most of these pharmacists in 10 years time won't be dispensing". (Q34).

5.4.2 Pharmacy Law and Ethics

Schools varied in the positioning of the law and ethics assessment within the degree programme. Three undertook this in the third year, two in the second year, two over years 2 and 3 and four in year 4. One school undertook assessment in all years of the programme and claimed not to have a single assessment point. Information was lacking from two schools. One school assessed it over the final semester of 3rd year and the first of 4th year with a single examination at the end of the first semester final year (and so within 6 months of graduation).

5.5 Do Assessments Measure the Necessary Qualities?

School respondents were asked whether they considered that their assessments measured the full range of qualities necessary to be a pharmacist. A total of 22 answered this question - of which 6 were confident that it did. Of these one respondent, an experienced senior academic, commented:

"I think the answer to that depends on what our opinion is of those qualities. If it is correct then I think yes - but I guess there are arguments as to whether the qualities we assume are correct are actually the right ones". (Q35).

Another respondent made the point that the assessments were designed to match the learning outcomes of the modules and that they did this. The remaining respondents considered that whilst assessments did measure most of the qualities, there were some qualities that were not being assessed. Some gave examples - usually work place skills. All gave some explanation as to why there was this apparent mismatch - see Table 5.1.

The distinction between entry to preregistration training and entry to the pharmacy profession was clearly articulated.

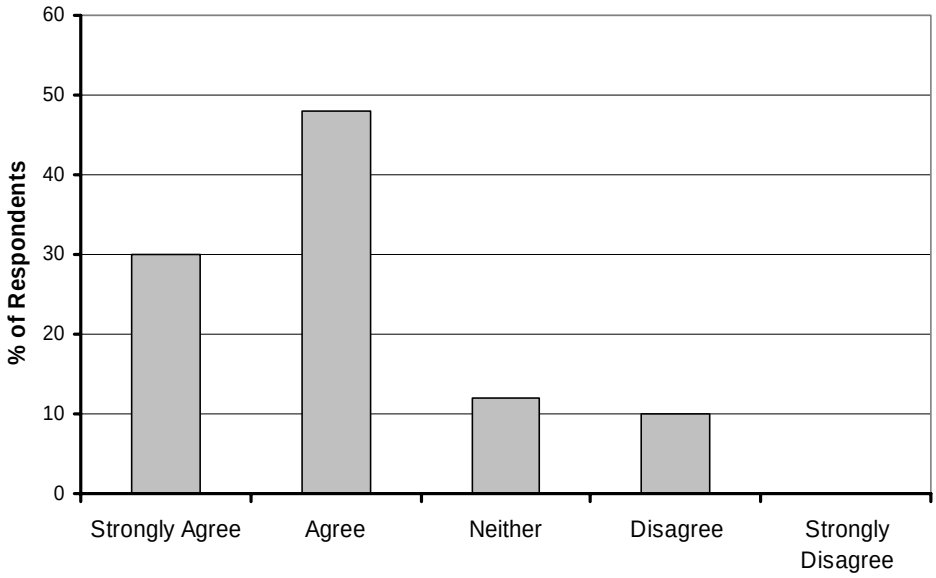
"I think they are ready for their prereg year but certainly not ready to be a pharmacist". (Q36).

Table 5.1: Reasons given by school Respondents for the failure of assessments to measure all the skills necessary to be a pharmacist.

Reason	Number of Respondents
Cannot assess some essential qualities out of the workplace (attitudes/skills)	9
Assessments too biased towards examinations and therefore do not reflect skills needed	4
Not designed to produce a pharmacist but a preregistration student	3

The student survey included two questions that explored these issues. Students were asked their agreement with a statement "Assessments don't measure the skills for being a pharmacist they just measure your knowledge base" (see Figure 5.3).

Figure 5.3: Agreement of UK final year students with the statement "Assessments don't measure the skills for being a pharmacist they just measure your knowledge base".



A very substantial majority (78%, n=575) of respondents either agreed or strongly agreed with this statement compared with 10% (n=77) who disagreed. The second question sought agreement with the statement "I consider that the assessments used in the MPharm course adequately measure the skills necessary to be a pharmacist". Despite the use of the term "adequate", nearly half the respondents (49%, n=358) disagreed with the statement whilst 17% (n=124) agreed. About a third of respondents were not sure (35%, n=256).

These findings raise further issues about the development of assessment methods and strategies that can reflect the qualities needed for professional practice.

5.6 Volume of Assessment

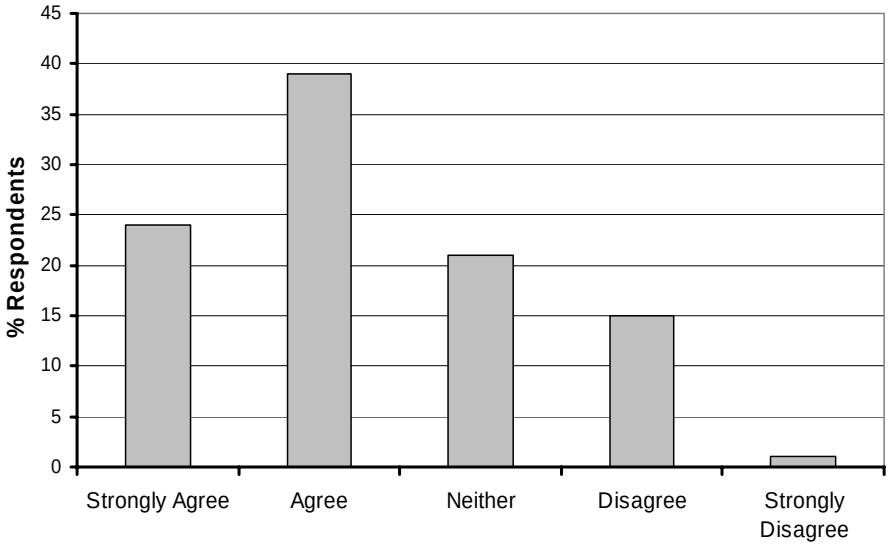
These questions were asked in all the school interviews. Respondents from half of the schools believed that there was probably some degree of over assessment. Concern was expressed both from the point of view of the student and from that of staff faced with rising volumes of assessment. Modularisation was raised as an issue affecting assessment volume by respondents from 9 of the 14 schools operating a modular scheme. Other issues were the emphasis upon written examinations and the difficulties of assessing coursework - plagiarism and the marking load. The answers reflected an awareness that the assessment load on the pharmacy degree was greater than on many other degrees - so even when the view expressed was that the assessment load was correct, several respondents qualified their response by reference to other subjects.

"*I think I probably do [consider volume about right] but then when I look at other degrees and other people's children and what they do, I do wonder whether we over assess". (Q37).*

The majority (76%, n=562) of students who responded to the survey considered that the amount of formal assessment on their MPharm programme was about right. However, about a fifth of respondents (21%, n=158) thought it too much compared with only 2% (n=18) who thought it too little. In contrast, there was an overall agreement with the statement "I think we seem to have more assessments than other courses" (see Figure 5.4).

These findings closely coincided with those from the staff interviews - the assessment load was about right but nevertheless more than many other courses.

Figure 5.4: Agreement of UK final year students with the statement that "I think we seem to have more assessments than other courses".



5.7 Attrition

All schools reported very little attrition after the first year of the programme and only a modest loss in first year, a large part of which was due to students leaving for personal reasons rather than because of academic failure. Only two schools were concerned at current levels of attrition because in these cases it was a recent but rising trend. They were generally cautious about giving absolute numbers. Most schools reported an intake predominantly of school leavers with good entry grades.

5.8 Key Findings

1. Examinations were the main form of assessment in the first three years of UK programmes but contributed less in the final year.
2. There was a significant variation in the contribution of examinations to final year assessment and therefore to the final degree classification.
3. Schools used a wide variety of coursework assessments. OSCEs and interactive video assessments were used in half the schools.
4. Although the majority of students considered the balance of assessment between examinations and coursework to be about right, about a quarter considered that there was too much emphasis on examinations.
5. Just over half of the student respondents considered that assessments were too heavily weighted towards knowledge rather than skills.

6. In the majority of schools, science assessment was front loaded and practice contributed a greater proportion of the year mark in years three and four than in the first two years of the programme.

7. Variations in the contribution of the different years of study to the final degree mark, coupled with variations in the practice contribution by year, meant that there were large differences between schools in the contribution of the practice element of the programme to the final mark.

8. Current assessment of professional competence was heavily focussed upon dispensing and pharmacy law and ethics.

9. There were marked differences between schools in the assessment of dispensing competence and some indication that this area is being down-graded in importance.

10. Both staff and students considered that whilst the amount of assessment was about right, it was considerably more than in other degree courses.

11. A majority of both staff and student respondents considered that the current assessments do not measure all the skills necessary to be a pharmacist.

12. Staff considered that the lack of articulation between the degree programme and the preregistration year is viewed as a significant difficulty in developing assessment of clinical and professional competence.

13. Attrition in UK schools was reported by staff to be low and mainly to occur in the first year of the programme. About half of the current attrition was said to be due to personal reasons rather than academic failure.

6. MULTI-PROFESSIONAL TEACHING AND LEARNING

6.1 Nature and Extent

In this study we defined multi-professional as describing co-education with other health professional students and multi-disciplinary as co-education with students from other disciplines. We also distinguished “didactic teaching” from learning where there is interaction between the various students involved.

Out of the 16 UK schools that were visited, 6 undertook some multi-professional learning with students of other healthcare professions, one was involved in some multi-professional teaching and 5 undertook some multi-disciplinary teaching with other science students. In the other 4 schools, the whole of the pharmacy programme was delivered only to pharmacy undergraduates. One school was involved in a major DOH funded pilot for multi-disciplinary learning but at the time of this study, this was only in the first year of operation.

All of the staff interviewed distinguished between multi-professional education with other health professionals and multi-disciplinary education. Whilst 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 multi-professional education. One school had a significant amount of joint teaching between pharmacy and medical students. The respondents from this school were very clear that this was done for logistical reasons and that educationally there was little benefit because of the large numbers involved (some lectures reported to be in excess of 500).

Of the six schools that were involved in multi-professional learning, three were delivering this to first year students and three to final year students. Two of the schools working with first years were early in the implementation of new curricula which included plans for roll-out to students later in the programme (includes the school involved in the DOH pilot). The third school hoped to extend the provision to later years depending on resources. Two of the schools had initiated this at a local level and one school was part of a national study with significant external funding. All of the schools with involvement at final year had planned and developed this at a local level. Table 6.1 below provides an overview of the activities being undertaken at these schools. To ensure anonymity the school codes have been removed.

Table 6.1: Summary of reported multi-professional learning in UK schools, 2004.

FIRST YEAR OF COURSE
Introduced 2003/4 and involving a multi-professional session with physiotherapy and nursing students. A pharmacy module.
Institutional multi-professional module in first year attended by all health care students including pharmacy, medicine, dentistry, nursing, physiotherapists, radiologists. At beginning of first year and runs in groups of about 40. It was reported that not all students attended.
First stage of a four year programme involving all health professional students in two universities (medicine, nursing, pharmacy, radiology, physiotherapy etc). Several thousand students from two geographical sites. DOH funded pilot. First year focuses on team building - group work, task based. Not clinical - no patient contact planned. But will be problem based - involving a range of problems (clinical, service delivery, ethical, funding etc).
FINAL YEAR OF COURSE
Implemented 2002/3 following pilots. Involves fourth year pharmacy students and fourth year medical students. Group size of 8 undertaking case-based learning. Location is postgraduate medical centre which involves movement of students. Pilots on ward based learning - again small groups and case based with discussion.
Ethics module in final year - scenario based multi-professional sessions involving pharmacy, medical and nursing students.
Ward based teaching designed for inter-professional education for students of medicine and nursing. Pharmacy has now engaged for a 1 week session.

6.2 Perceived Value

There was general support for the concept of multi-professional learning, regardless of whether the respondent's own school were involved in its delivery. The perceived advantages were also similar regardless of involvement and the principal one 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.

"*I think that experience of other health professionals, of just seeing things from a different point of view, and from people that you're going to be working with in the future would be very useful'. (Q38).*

A number of other advantages were recognised including:

- Understanding of what other health professionals can bring to the healthcare team.
- Breaks down barriers.
- Seeing things from a different point of view.
- Prevents misconceptions and allows students to appreciate others' strengths and weaknesses.
- If implemented early enough, can prevent the development of professional prejudices.

Respondents from schools that were involved in multi-professional learning were positive about the engagement of pharmacy students.

"I think the pharmacists are delighted that the medics in particular find that the pharmacists know a lot more about things then they do; so it was a big positive boost I think to the pharmacy students". (Q39).

6.3 Barriers and Difficulties

All respondents with experience of multi-professional learning were united in the view that it was difficult to organise. The common experience was that multi-professional learning must be interactive. In addition, however, there was recognition of the importance of managing the sessions and of careful planning and preparation.

"It's not simply a question of getting a room full of medics, nurses and pharmacists and saying off you go - like a dating agency. It has to be quite skilfully managed because you have to try and encourage them to co-operate without appearing to be too authoritarian and they tend to congregate into mono-disciplinary groups". (Q40).

All with experience spoke of the logistical problems of organising large cohorts of students into small group sessions that had a reasonable disciplinary balance. An additional problem was when there was more than one institution involved.

"It's a challenge. It's a good way of describing it - the logistics of it are frightening. When you sit back and think about it the logistics, they scare you witless. You've got to co-ordinate a module with a load of other courses, two institutions, two sets of regulations - the design was a challenge but having said that it seems to be making progress". (Q41).

A related challenge was the difficulty of achieving a balance between student numbers from the different professions. This was regarded as a particular problem with nursing because in many institutions this has very large numbers and two annual intakes. Two of the respondents spoke of difficulty in engaging the interest of medical students, particularly those in the final stages of their programmes. This was seen as a particular problem with clinical studies. Speaking of previous experience rather than the current activity within his/her school one programme leader commented:

"It was obvious that most of the medics who were doing the ward teaching were firmly saying "don't bother with the pharmacists they're not going to be of any use to you, tell them you're too

busy". We got a lot of negative feedback from the medics - they actually said it's not doing us any good at all, we're doing it as a favour to pharmacists". (Q42).

The difficulty in engaging medical students was also echoed by another respondent.

"I think it's been popular within pharmacy and nursing. I think it's been harder to sell to the medics". (Q43).

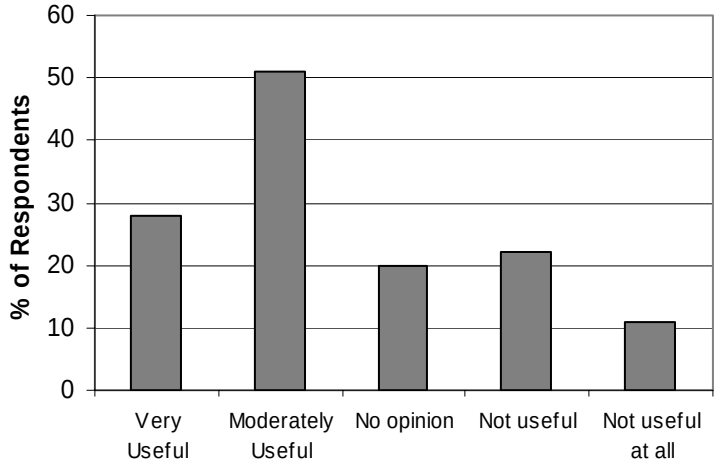
It appeared that a key factor was for the multi-professional education to be designed and developed by a multi-professional team rather than adding a student cohort into an ongoing situation designed for different students. Another was the need to consider carefully which year groups to involve - there was a view that it was not always best to work with students in the same academic year groups because the learning experience on different programmes varied too much.

All respondents were also very aware of the issue of resources. Small groups and large number of students need significant staff input. In one school the multi-professional unit in the first year had been developed at an institutional level with multiple professional groups from that institution. In contrast, two of the schools engaged with multi-professional learning were developing it as collaboration with other institutions. Here the usual problems of logistics were exacerbated by resource issues mainly linked to staffing, access to suitable premises where students could meet and the problem of getting students to sites that might be remote from the main campus.

6.4 Students' Perceptions

Students (n=132) in five of the six schools that offered multi-professional learning were asked how useful they had found this experience. A majority (60%, n=79,) found the experience either very or moderately useful (see Figure 6.1).

Figure 6.1: Views of final year UK MPharm Students on the usefulness of multidisciplinary learning provided by five schools (n=132).

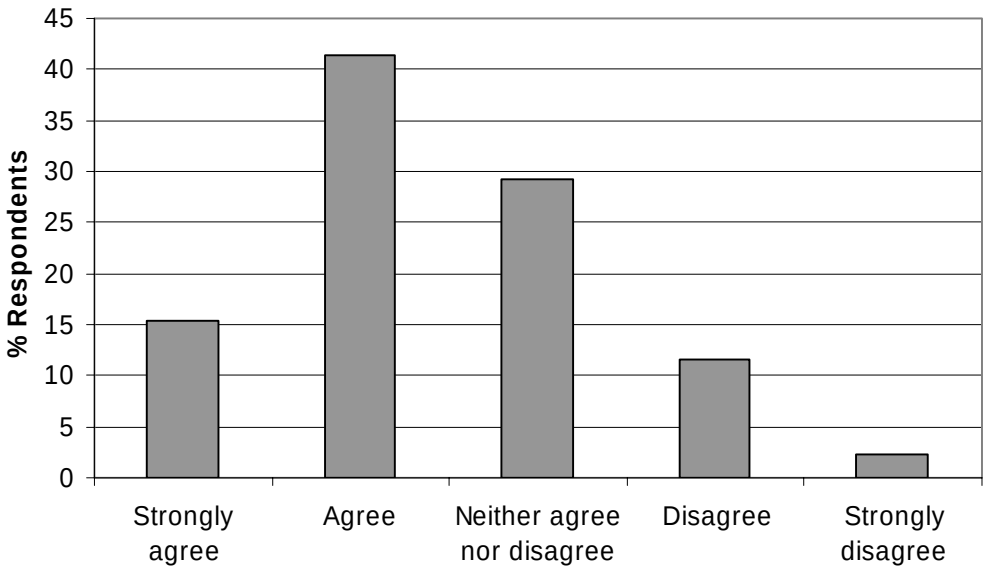


There was an indication of differences between schools but no firm conclusions could be drawn because of a wide inter-school variability in the number of respondents. It must also be borne in mind that the student survey was to fourth year students who, although they may have engaged in the pilots for current multi-disciplinary activity, would not have direct experience of current activity.

Respondents (n=59) from the school involved in multi-disciplinary teaching showed much less support for the process with only 31% of students stating that they found the experience moderately useful.

All respondents (n=741) were asked whether they agree with the statement that "Joint learning with other health professional students should be a requirement for all undergraduate degrees in pharmacy". Over half of the respondents (56%, n=412) either strongly agreed or agreed with the statement (Figure 6.2).

Figure 6.2 Agreement of final year UK MPharm students with the statement "Joint learning with other health professional students should be a requirement for all undergraduate degrees in pharmacy".



6.5 Key Findings

1. Six schools were involved in multi-professional learning - three involving first year students and three involving final year students. In all cases the current pattern was of recent introduction.
2. Staff from all schools of pharmacy were strongly supportive of the concept of multi-professional learning. The primary advantages were considered to be the development of a wider view of the students' future professional role and a better understanding of the roles of other professional groups.
3. There was a general view that to be successful, multi-professional learning must be interactive.
4. Experiences of teaching to multi-professional student groups were not positive and there were no perceived educational advantages and potential problems of scale.
5. Respondents with direct experience of multi-professional learning identified a number of potential barriers. The key ones were logistics, in terms of student numbers, organisational problems due to multiple sites and different timetables, the achievement of balanced numbers between disciplines and the engagement of students from all the participating disciplines.
6. A critical success factor was careful planning of multi-professional sessions both in terms of logistics and content.
7. Students from institutions offering multi-professional learning were generally supportive of the suggestion that joint learning with other health professional students should be requirement for all undergraduate degrees in pharmacy. However, because they were from the final year cohort, they did not have direct experience of current activities.

7. PLACEMENT EDUCATION

7.1 Vacational Work

Interviews with key staff revealed a widespread practice of recommending to students that they will benefit from working in hospital or community pharmacy during university vacations. However, only two schools required that their students complete vacational work. In one there was a requirement for a total of two weeks work placement with one week in the vacation between second and third year and one in the vacation between third and final year. Both placements were in community pharmacy and were supported by a work book detailing the experience the student was expected to achieve. The community pharmacy signed off the placement but there was no marking. In the second school, each student was expected to complete a 2-week placement in both community and hospital pharmacy. It was stated that the majority of students completed this in years 1 and 2. The main reason given by respondents from other schools for the decision not to require a vacational experience was the difficulty of ensuring access for all students.

7.2 Professional Work Placements

7.2.1 Current Activity

All of the staff interviewed were strongly supportive of the concept of professional work placements. All schools provided some learning activity in local hospitals but only two in community pharmacy. A further two required structured vacational experience (see section 7.1 above). The experience in hospital varied from a few hours over the entire 4-year programme to a maximum of about 16 days in hospitals, again over the entire programme. One school was using 2-week placements during the third year with further hospital based teaching in the final year. In another there were clinical hospital-based sessions throughout the third and final years amounting to half a day per fortnight for each student. 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. Respondents clearly distinguished between experiential type visits and structured clinical learning and only the latter has been considered as placement activity for the purposes of this report. For example, one programme leader recognised the progressive development of skills through placement activity:

"*It's not just about our acclimatisation experience - in the final year it's much more about developing clinical skills, and again there will be progression through the three years". (Q44).*

All schools recognised the need for increased placements and both programme leaders and pharmacy practice staff spoke of their frustration at the difficulties involved in developing this aspect of education.

"We would desperately like to do more and we're at a stage where we have a number of options that we can take, we can wait for the Department of Health and HEFCE to decide that pharmacy really should be funded in a different category, I'll probably have been retired by then. Opportunities locally are to try and wedge them in with other professionals". (Q45).

There was a general view that the major difficulty was in engaging external partners and in funding the placement teaching. There were differences between the hospital and community sectors. Both required funding but there were additional problems with community linked to its location in the private sector and the small unit size and the consequent need to involve multiple venues. Several respondents indicated that movement in this direction would engender change in the internal curriculum - professional placement education was therefore seen as a rate-limiting step for overall curriculum advance.

"*We would really very much like to do more, we're hindered or hampered or whatever by slightly lacking in curriculum time, having said that if we had the facilities, if we had the need to*

we could reduce some of the other teaching to put clinical placements in but it's more that hospitals are greatly short staffed and getting them to facilitate what we've got is a feat in itself and the thought of more gives them an apoplexy". (Q46).

In many cases the placements were experiential without formal assessment. Where there was formal assessment, this was usually in the form of coursework, most commonly a pharmaceutical care plan.

7.2.2 Examples of Success

Perhaps most notable were the two schools that had achieved at least temporary funding from NHS Workforce Development Confederations (later Directorates). However, there were many other achievements made against a background of lack of explicit funding and the need to rely upon "grace and favour" type arrangements. One example related to a half day session in an operating theatre organised by a school - this focussed upon the drugs used and was run by anaesthetists. Although still running, this was due to the efforts made by school staff. The pharmacy practice lead spoke of the difficulties that had been experienced:

"We did have difficulty for a couple of years but we managed to resurrect it and it happens now usually around Easter time when the medical students are not in theatres and we get them all done - all of the visits in a three day period by sending them to a range of different hospitals". (Q47).

7.2.3 Limitations and Constraints

Even where there was a history of success in running hospital based teaching, there was concern over the ability of schools to expand this provision. One issue was the capacity of the local environment. An example was a school that had put great efforts into developing block placements:

"*We are very much aware that we need to expand the ward based teaching, we've been forced to curtail that somewhat over the last two or three years and it has to be expanded back out again but that can't be handled in the local city - the hospital is uneasy and unwilling really to absorb what we would like to do". (Q48).*

A recurring issue was the lack of any explicit funding stream to support practice-based education.

"I'd like to see it expanded but we haven't got the funding in the school to do it - I'd like to see external funding for it, through PCTs. There should be NHS funding for it - they do it for nurses, they do it for medics and we're still funded on the science base". *(Q49).*

All respondents were concerned about the logistics of handling student numbers, the access to NHS facilities and the funding support for staff.

"Logistics are a barrier, timetabling is a barrier, you know just getting them out to the hospitals, getting them time to travel, making sure they go there, it's just getting to become a real organised part of the course, which it is. It works at the moment but let's say having dedicated personnel out there is really going to help. *(Q50).*

This was equally true of the two schools with funding support from local Workforce Development Confederations (later Directorates). Here the funding addressed the logistic and staff problems but there was a concern over the perceived lack of flexibility of this funding - it was limited to a set number of staff in set hospitals.

"Y*es the Workforce Confederation funds these tutors, but I don't know whether they'd fund another one but these things have been running for five years or so now and they work well but it was a lot of hard work at the outset and I think the idea of moving to a new hospital and starting all over again – well". (Q51).*

In relation to resource, a frequent complaint was the lack of any explicit funding stream to support practice-based education and there were frequent comparisons with other health professional programmes. An example came from respondents in a school situated within a University with a medical school - the comments here emphasised the problems for pharmacy. Even though placements were established for medicine and other NHS funded programmes, and were facilitated in a review of dental provision, pharmacy was regarded differently.

"I've talked to the Dean of the Medical school for example. He said "fine - if you've got funding". I thought why can't our students just wander freely on the wards, I mean the hospital is just there but because we haven't got the funding they can't". (Q52).

7.2.4 Future Developments

Several schools were working on plans to improve current provision. In general, these were developments of existing provision rather than a major advance on provision. There was recognition of the need to develop community and primary care teaching but little optimism that this could be achieved. One school was linking some interaction with primary care and community to their existing hospital based education.

"What we have done is - we've got enough hospitals signed up so that the students can go for six half days plus a couple of extra things tagged on to the end, like GP visits and going to see the Primary Care Pharmacists - so they'll get eight half days".(Q53).

Concerns were expressed about future capacity, particularly in view of the difficulties within the NHS on overall placement provision. One programme leader spoke of concerns for pharmacy until it managed as a profession to establish formal links.

"We do have a problem in as much that funding agencies are going to be looking to drop pharmacy down the list in terms of funding and on the other hand they're wanting greater clinical input, that has got to come from somewhere". (Q54).

However, there was also optimism and most significantly, several recognised the willingness of practicing pharmacists to become involved:

"I think there is a great swell of opinion among community pharmacists at the minute that they have a duty to help develop the next generation of pharmacists, I think they will be quite keen to help". (Q55).

7.3 Role of Teacher Practitioners

The majority of the schools involve teacher practitioners (TPs) in both the organisation and delivery of placement education. All schools had a mix of teacher practitioners. Precise numbers were often not available, usually because schools also employed external pharmacists as sessional staff and in some cases had voluntary input. Two schools had employed practitioners on term time only teaching contracts with the remainder of their time spent in practice.

The teacher practitioners were regarded as a key resource and one of the key factors in informing course development in line with practice needs. Most of those involved in placement teaching were funded on local arrangements with NHS hospital trusts. A variety of other staff were also involved - most commonly hospital based staff who contributed to postgraduate courses and sessional staff.

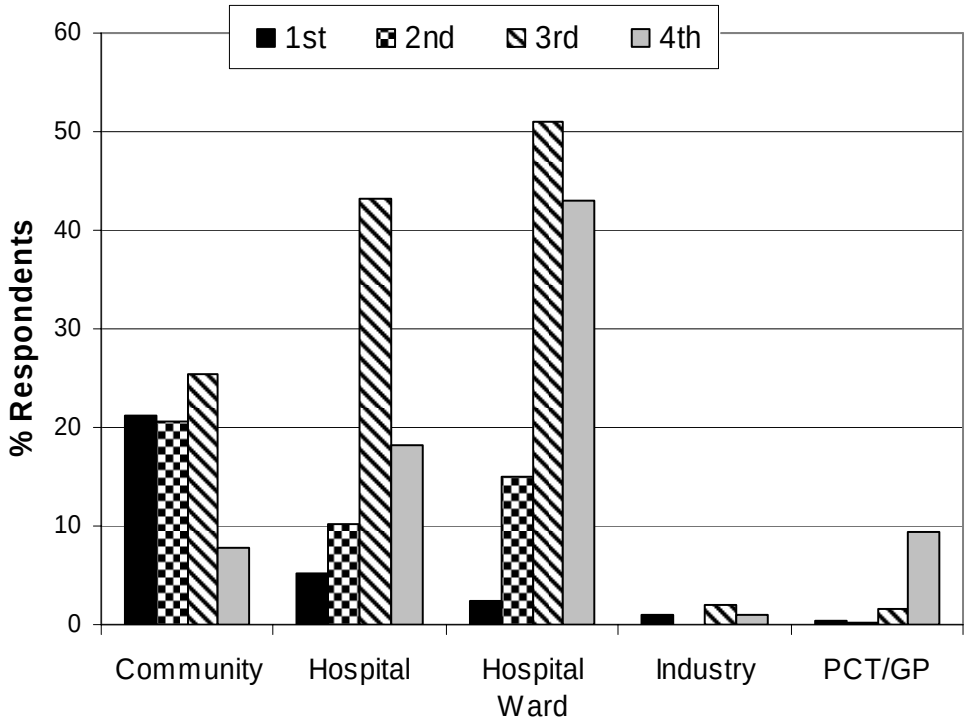
Two schools had formal agreements with their local NHS Workforce Development Directorates who provided funding for trust based clinical teachers. In both cases these staff held university appointments and were accredited university teachers. The heavy dependence upon part-time staff and external staff was clearly an issue in developing systematic assessment methods for a full range of knowledge, skills and values.

7.4 Student Perceptions

A total of 84% (n=622) of student respondents to the questionnaire (n=741) stated that they had experienced a formal placement. This was defined as "*a period of practical experience in a pharmacy or clinical setting that is an integral part of your MPharm course - for example, a visit to a hospital pharmacy. We are not talking about vacational work in a pharmacy that you organise yourself*".

In line with the responses from staff, students identified hospitals as their most common placement experience. The questionnaire distinguished between a hospital pharmacy placement and a hospital ward based placement. Figure 7.1 summarises the data from the survey showing the percentage of respondents who had experienced placements in community, hospital, hospital clinical, industry and primary care or general medical practice.

Figure 7.1: Percentage of final year UK students who had experienced placement education in different branches of pharmacy shown by year of the MPharm Programme.



Few hospital placements took place in the first two years of study. But community placements were mainly in the first three years of study. There were very few placements in the pharmaceutical industry (less than 3% of total respondents). Placements in primary care or general medical practice were almost all in the final year: but about one tenth (9%, n=58) undertook such placements. However, these students came from 4 schools and 86% of them from one school: so the practice is not common across the system.

Students were strongly supportive of the inclusion of placement education within the MPharm - 90% (n=670) either agreed or strongly agreed that there should be a placement in at least one year of the programme and 54% (n=402) that there should be professional placements in every year of the programme.

7.5 Key Findings

1. All schools recommended that students should obtain vacational experience in hospital or community pharmacy, but only 2 required this as part of the curriculum.
2. All interviewed staff were strongly supportive of placement education as part of the curriculum and all recognised the need to develop and extend this activity.
3. All schools undertook some formal placements in local hospitals, but only two involved community pharmacy.
4. A clear distinction was drawn between experiential visits and formal placements with defined learning objectives. Only the latter have been considered in this report.
5. Key issues that limited development of placement education were access to sites, the local capacity for placement teaching, resources (both staffing and funding) and the logistics of timetabling, particularly when travel was involved.
6. Two schools had obtained funding support from their local NHS Workforce Development Confederation (later Directorate) to provide clinical teaching and there were other examples of success.
7. Plans to develop placement education were largely through incremental growth and major developments would require resource.
8. In all schools teacher practitioners and other part-time staff were critical to the implementation and development of placement education.
9. Results of the student survey confirmed that most had received placement experience in the final two years of their course. Most students were supportive and favoured placements as a compulsory component of the MPharm programme.

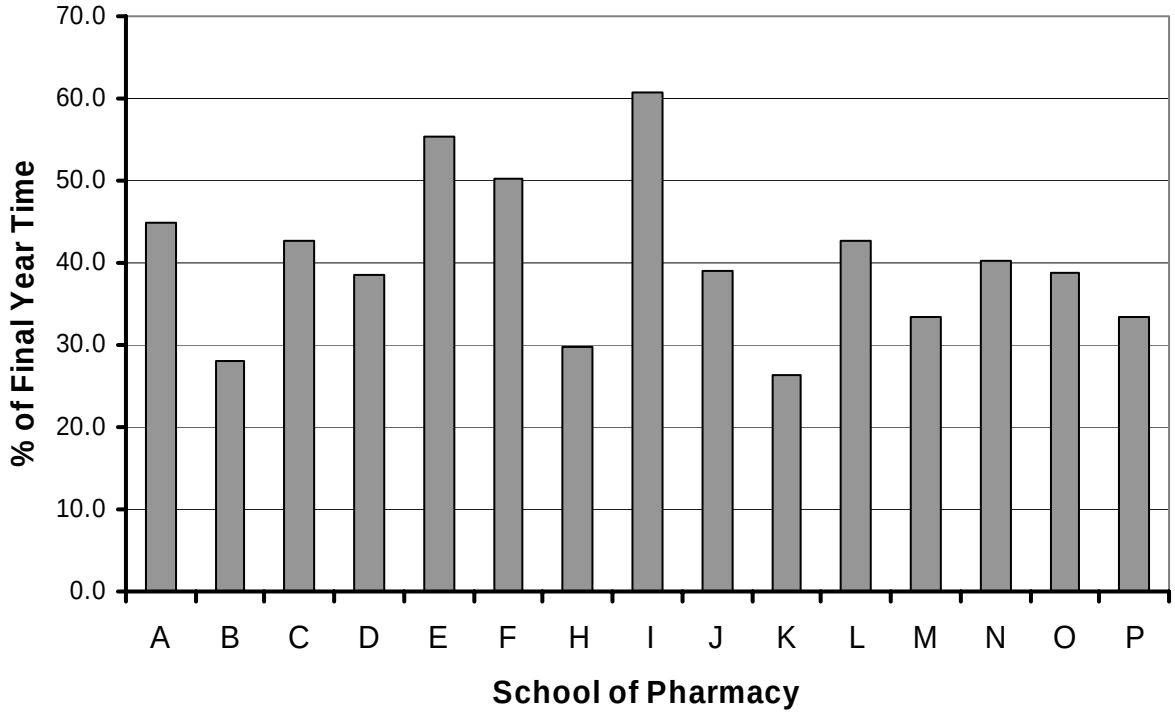
8. RESEARCH PROJECTS

8.1 Assessment

8.1.1 Contribution to the Overall Programme

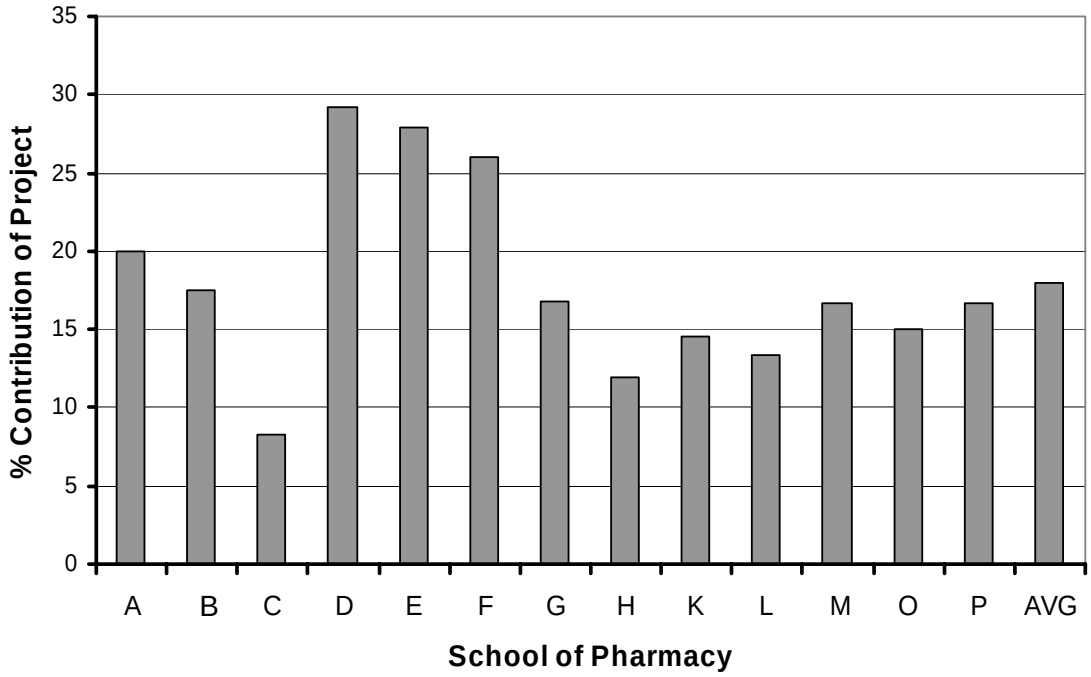
All 16 schools offered a final year research project with topics spanning the full curriculum from laboratory science to clinical practice and professional studies. In all schools, projects were given a nominal time allocation, usually made up of laboratory or research time and directed study time and therefore the total time allowance has been regarded as an indication of time that the student is expected to spend on the project. When expressed as a percentage of the total time indicated for the final year, it can be seen that there was some variation between schools (Figure 8.1). On average, 40% (n=15) of the allocated time in the final year was expected to involve the research project but the range within schools was from 26% to 61%. The average rated time for a project was 387 hours with a range from 183 hours to 500 hours. Most schools included a mix of practical time and directed study within the project rating. Data for one school was not available.

Figure 8.1: Percentage of the total final year time expected to be associated with the Final Year Research Project.



There was also significant variation in the contribution of the final year project to the overall degree classification. It was possible to accurately calculate this only for the schools that ran a full modular system where the proportion of the final year assessment from any element was reflected in the credit loading. The data was adjusted to take into account the proportion of the final degree mark that was derived from the final year. Of the 16 schools, 2 were non-modular and were therefore excluded from this calculation and a further school used a profiling system to calculate degree class rather than a numerical calculation. The data for the other 13 schools is summarised in Figure 8.2. On average, 18% of the degree classification arose from the final year project but the range was from 8% to 29%. It is notable that the mark contribution differs from the time allocation and this is likely to reflect variations in the way in which schools estimate directed study.

Figure 8.2: Percentage contribution of the Final Year Project to the Overall Degree Classification in UK schools. AVG denotes the sector average.



8.1.2 Approaches to Assessment

Although there were variations in the contribution of the project to the overall degree, interviews with key staff in schools revealed a common approach to the process of assessment. In all schools, projects were either double marked (blind) or moderated (non-blind) by a second member of staff. All schools had mechanisms for adjudication of a final mark should the two assessments differ significantly and all involved the external examiners in undertaking a final moderation of the project mark. It was clear from the interviews that staff were very aware of the potential for variations in standards.

8.2 Preparation for the Research Project

Interviews with key staff revealed mixed evidence on the provision of formal research methods teaching, whether laboratory science methods or pharmacy practice social science. Four schools dealt with the delivery of methods knowledge through “on-the-job” training alongside the running of the research project with teaching by the specialist academic group concerned.

“I would hope that a lot of people bring research into their lectures anyway , but we give them a little bit of critical literature review and research methods and those that are doing practice projects [we] have done sessions on qualitative research”. (Q56).

Seven schools had a comprehensive research methods module covering the range of research from laboratory science to social science and clinical. This was exemplified by the following comment:

“We have a research methods component to the research project unit and it takes up about a quarter, so it’s 100 hours of study”. (Q57).

The timing of delivering formal training also varied. Some students received training in year three before they decide on a topic, whilst for some it was during the implementation of the project. Discussions with programme leaders revealed an awareness of the need to make provision prior to the project and the situation is therefore dynamic.

"*We used to cram it in the beginning of the fourth year but we will now have a research methodology skills week which will address generic research questions like appendix, numbers and statistics, but there will also be special sessions for pharmacy practice on questionnaire design and so on and lab safety as well, as for basic science ones and whatever they feel necessary". (Q58).*

The students were divided in their perceptions of their preparation for the research project. When asked whether they considered that their training in research methods had provided a good foundation for the project, about one third (36%, n=264) responded that it had whereas 40% (n=299) responded that it had not. A further 24% (n=178) were not sure. There was an indication of possible differences between schools. In three schools over 50% of students were positive about their preparation for the project and conversely in 4 schools, over 50% of students considered that their preparation had not provided a good foundation for the project. Interestingly all of the 4 schools in which there was a high level of dissatisfaction did provide a research methods training module. Whilst these findings are indicative, statistical validation is not possible because of the variation in the overall response rate between schools.

8.3 Project Allocation

Interviews with key staff revealed a range of methods used for project allocation. Almost all referred to having tried a number of different approaches and to the difficulty in devising an allocation process. A total of seven schools used an allocation process in which the student first chose the subject area - in the case of two of these schools the selection was linked to choice of a wider "elective" area. In the remaining schools students chose a title from an array spanning all subjects and in three schools the students could originate a title.

Without exception the allocation of research projects was described by staff as a complex and time consuming activity. The high numbers of pharmacy undergraduate students has made the process even more complex and time consuming. Great effort is put in to try and ensure everyone has a choice, although not everyone gets their first choice of supervisor or project. Overall, half the students considered that they had enough choice in the selection of their research project (50%, n=367) although just over a third responded negatively to this question (36%, n= 270). A relatively small number (14%, n= 104) were unsure.

8.4 Supervision

The interviews with key staff identified three key concerns in relation to project supervision - external supervision, supervisory capacity (an issue linked to student numbers and resourcing) and the more sensitive issue of supervisory capability.

8.4.1 External supervisors

The use of external supervisors in practice locations varies. Twelve of the 16 schools did make use of external supervisors for projects, mainly in hospitals but also in primary care trusts and in industry. In all cases, there was joint supervision with an internal member of staff with the external practitioner variously described as an external partner or collaborator. In this sense, it may be that the terminology of external supervisor is inappropriate since it implies a handing over of responsibility to an outside pharmacist. What appears to happen is that the external supervisor facilitates the project and at best is involved in joint management with an internal supervisor. All schools who involved external staff stated that clear guidance and protocols need to be in place to cover this role.

"Of course every external supervisor is like a minor supervisor, the actual project supervisor is actually a member of academic staff". (Q59).

8.4.2 Supervision capacity

All the respondents from schools recognised the impact upon projects of increasing student numbers. One response across the system had been an increase in group work - a total of 9 of

the 16 schools were formally using group work and in two others it was recognised that it happened but at the level of the individual supervisor. In three schools all students were grouped, with 5/6 per group, so that staff could produce bigger studies more likely to result in publishable work. Staff recognised that group projects were an area of educational debate. There were some concerns that group work may dilute the individual student experience. However, in schools with a formal policy for group projects there was a firm view that group projects not only support the staff needs for RAE publications, but also actually enhance the student experience. In view of this, it appears that the group project is an area that needs further consideration.

8.4.3 Supervision capability

The school interviews also identified the expertise of research supervisors as a key question in relation to project supervision. This was particularly seen as an issue in the pharmacy practice and clinical areas where there was said to be a relative lack of permanent academic staff qualified to PhD level with significant dependence upon teacher practitioners. The workload problems on core staff were also seen to be compounded by the limited research experience and capabilities of most teacher practitioners and their high mobility which can lead to a constant need to reinforce the capability infrastructure.

In the area of practice and clinical projects there were lengthy discussions about the impact of new Local Research Ethics Committees, NHS confidentiality and PCT research committee requirements. There was general agreement that these changes, which all became binding from April 2004, are having a detrimental affect on pharmacy undergraduate research projects. In some schools there has been a change in the project timetable in an attempt to meet the new requirements.

"The main problem is that to apply for ethical permission you have to have everything ready before you put it [LREC form] in, so therefore the students couldn't be involved in the design of the survey or whatever because they didn't start until the second term….Having the new advanced studies module might help overcome that, but it still relies on prompt responses from the ethical committees to work". (Q60).

Other schools had changed the nature of research projects to be more bench or desk research, or linking in on PhD work that already has approval.

"It has changed the nature of projects and perhaps we'll need to look at more bench space projects". (Q61).

"We're trying to think of ones [projects] that don't need it… We're doing lots of projects on students". (Q62).

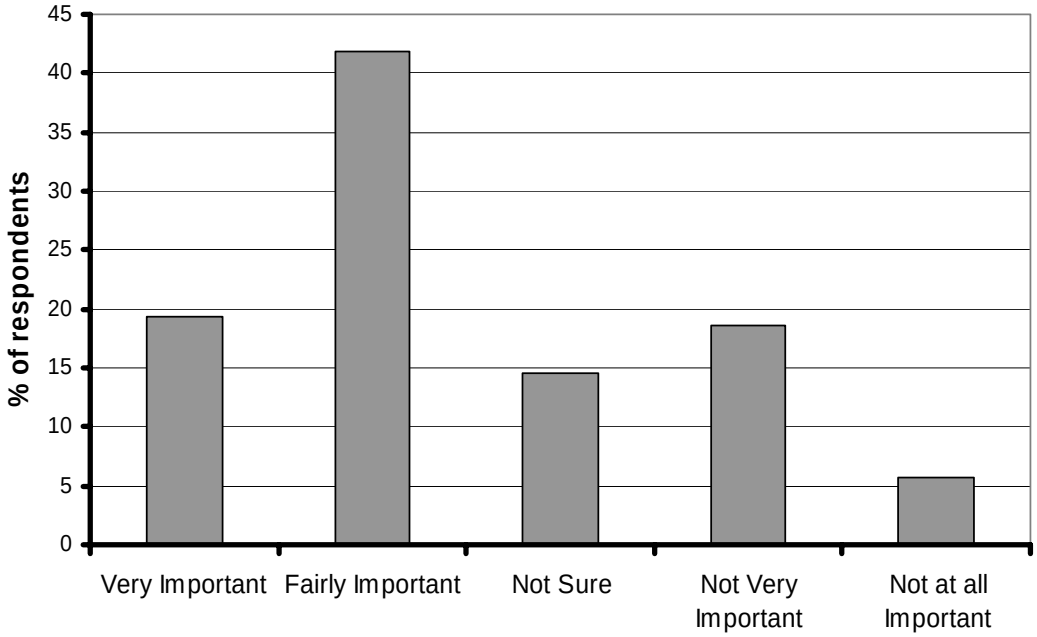
One school had not experienced problems but there was still concern about the future ability to meet legislation.

"*Not yet, [we haven't had problems] but we don't know how we are going to cope, we are worried". (Q63).*

8.5 The Value of the Research Project

In spite of the concerns above, staff were positive about the importance of the final year project with nobody seriously questioning its continuation. We were therefore interested in the views of students and in general these were supportive. A total of 61% (n=443) considered that the project was either very important or important whereas only 24% (n=180) considered it to be not very or not at all important (Figure 8.3). There was no significant association with age, with gender, ethnicity or previous experience as a pharmacy technician and no apparent differences between responses in the various schools.

Figure 8.3: Perceptions of students as to the importance of the research project in the MPharm programme.



8.6 Key Findings: Research Projects

1. All schools offered research projects across the full range of the pharmacy curriculum.
2. There were differences in the time allocation to the research project and as a proportion of the final year directed study it ranged from 18% to 61% with an average of 38%.
3. The final year project made a significant contribution to the final degree mark and the contribution varied with school over a range of 8% to 29% (mean 18%).
4. Schools had a common approach to assessment with either double-marking or moderation and extensive involvement of external examiners.
5. Preparation for the project through development of an understanding of research methods was variable ranging from formal courses to on-the-job learning to nothing. Where teaching was provided its timing was also variable in relation to the project.
6. All schools provided some student choice in project selection and over half the students were satisfied with the choice provided.
7. Schools varied in their use of external supervisors, but external involvement in supervision occurred in 12 of the 16 schools. In all cases, there was linked internal supervision and generally the external supervisor had a facilitatory role.
8. The major concerns in relation to project supervision were the number of projects and the capability to supervise in the professional and clinical areas where many staff lack formal research qualifications.
9. There were general concerns over the impact of research ethics requirements and the research governance framework upon future capability to offer projects based in practice (including clinical).
10. There was evidence of increasing group work in projects and this is identified as an area for further investigation.
11. Students and staff were positive about the final year project.

9. SUMMARY

This report is a benchmark of teaching and learning activity in the 16 established UK schools of pharmacy during the academic year 2003/4. It is based upon research with a pluralist methodology involving interviews with leading academic staff in each of the schools, a content analysis of course documentation from each of the schools and a survey of final year students in 15 of the schools. The co-operation and support of the schools was essential to complete the study and this is gratefully acknowledged by the research team. It has a broad coverage and is therefore necessarily at a relatively high level. Clearly a limitation is that the information from staff respondents was dependent upon their individual knowledge. Similarly, the documentary analysis was dependent upon the accuracy and accessibility of information in the standard documentation provided by each school. Where data was clearly missing we attempted to check back with the school and in most cases this was forthcoming. However, we were aware that for the schools, this was one additional element of workload during the busy academic year and when we were unable to obtain complete data, this has been indicated within the report. Despite these limitations, the report provides a snapshot of teaching and learning within schools of pharmacy during 2003/4.

9.1 Curriculum

Professional accreditation by the RPSGB emerged as the most important external driver for curriculum development. Furthermore, in most schools the focus was still upon the indicative syllabus rather than upon the outcome criteria which became the obligatory component of the new method in 2002.[2] This finding may well reflect the contemporary nature of this change and the fact that many schools will not have undergone accreditation under the 2002 method. However, we would suggest that the importance placed by schools upon the accreditation process does raise two major questions for the future development of pharmacy undergraduate education.

The first concerns 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. Accreditation is clearly a driver for conformity in the curriculum. This study has demonstrated broad similarities in the content, in hours of study and in the balance between the practice and scientific elements of the programmes. It can be argued that this is evidence of the effectiveness of the RPSGB accreditation in terms of the achievement of commonality of experience and process. However, in the case of pharmacy, the strong drive from accreditation is reinforced by the small size of the sector (16 schools at the time of this study), by good internal communications within the pharmacy higher education sector and by the activity of organisations that engender interaction between schools such as the heads of schools committee and the academic pharmacy group. These effects are further augmented by the activity of the RPSGB through events like the academic pharmacy teachers' conference and the annual British Pharmaceutical Conference. While all of these activities are in themselves positive, the question must be asked as to whether their interaction with the current accreditation process is resulting in too much conformity. This study has demonstrated a lack of student choice within curricula. With the exception of the final year project, where choice was limited to the area of research, schools offered students either minimum or no choice. Widening professional roles and the inevitable specialisation that will follow must raise questions about the need for diversity. In this respect it is notable that within the new medical undergraduate curriculum (Tomorrow's Doctors[48]) there is a recommendation that 25 to 30% of the curriculum should be student specified.

The second question concerns the articulation of pharmacy education with that of other health professionals. This study has provided evidence that in many schools, pharmacy undergraduate education was relatively insular. Across the whole system there was little shared curriculum with other health professionals or other disciplines. The second most common external influence upon the curriculum was the QAA Pharmacy Benchmark, another pharmacy

specific document whilst in contrast, changes in the education of other health professions, NHS and government policies did not emerge as major influences. 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.[7,54] We recognise that this is a complex issue. The historical technical function of pharmacy and its placement in the technical education sector has undoubtedly contributed to the fact that pharmacy undergraduate education currently has no national NHS links and is funded differently from the education of almost all other health professions. However, we would suggest that this has been compounded by an accreditation process that is relatively introspective. There are currently major changes taking place in the education of health professional students such as the move to a common core curriculum.[17] One positive consequence of the focus of schools upon accreditation is that through a review of the process, the RPSGB could bring the wider health professional agenda into mainstream pharmacy education.

Another important finding in relation to curriculum development was the lack of communication between schools and the RPSGB in relation to articulation of the undergraduate degree with the preregistration process. School respondents were generally critical of what they regarded as very weak integration and most schools relied upon *ad hoc* mechanisms for any awareness of the preregistration process. We would suggest that this is a fundamental weakness in the current educational process for entry to the register. Amongst 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. In our view there is an overwhelming case for a formal engagement between the RPSGB and the schools of pharmacy to reconsider the linkage between the undergraduate degree and the preregistration training process.

Although student numbers emerged as a major concern, a positive finding was that schools were all confident that increased numbers had not affected the curriculum. Related concerns were raised in relation to disability and widening participation. Schools had not changed their curriculum to adapt to government policies in these arenas, but several respondents mentioned that they had changed methods of teaching and delivery and that the need to meet the requirements of government disability legislation was influencing assessment. The potential impact of this upon the eventual qualification for professional registration is another issue that needs to be addressed by the RPSGB. This in turn raises the issue of a definition of professional competence and this is considered in more detail below.

9.2 Teaching and Learning and Assessment.

A common finding across all schools was that the programmes were relatively didactic with a heavy dependence upon formal teaching and particularly upon lectures (accounting on average for 50% of taught time). Although students were generally supportive of the importance of lectures for their learning, there was some evidence that this view was at least partly a reflection of the focus upon lectures for delivery of the course. Professional and clinical practicals were highly valued by students but in general, science practicals were not. This contrasts with the emphasis upon practicals in both the EU directive on pharmacy[1] and the RPSGB accreditation requirements[2] and is further evidence of the need to review the objectives behind the accreditation method. In contrast, however, the strong science base within the pharmacy curricula was generally appreciated by students and consequently it would appear that the more negative views on practicals are not simply a reflection of views on the science component of the degree.

An important finding in relation to undergraduate pharmacy programmes was the high level of directed study. Although driven by the need to meet the EU directive on hours of directed work, it was interesting to find that most schools had poorly developed policies on directed or student

centred learning, little institutional guidance or support and in the majority, the definition and specification of this activity was left to individual teachers. Part of the difficulty with directed study is that the current accreditation requirements of the RPSGB[2] have incorporated the recommendations of an EU advisory committee on pharmacy education which met in 1994. These specify that a pharmacy undergraduate degree should include a total of 3000 hours of "directed or supervised" training and provide minimum volumes for practical work (35%) and material relating to the action and uses of drugs (35%). These recommendations are not part of the EU directive which only specifies the minimum length of the undergraduate degree as 4 years. However, they have been incorporated into the RPSGB accreditation requirements which effectively gives them equal weighting to the directive. The normal credit tariff for four years undergraduate study provides 4800 hours of total undergraduate work but does not provide definitions of "directed or supervised". This study demonstrated that across UK schools of pharmacy, the total formal contact averaged 1597 hours. Consequently all schools included directed study to meet the accreditation requirements and all had to incorporate various forms of interactive learning under the definition of practical in order to meet the volume requirement. Notably the accreditation requirements provide no guidance either in terms of a definition of "directed or supervised study" or of what constitutes a practical.

We would suggest that there is an urgent need to review the decision to include the advisory committee recommendations within the RPSGB accreditation requirements. The degree programme length meets the EU requirement and the hours taught are at least comparable with many other undergraduate programmes - in fact both staff and students in this study considered that the workload was higher than in other programmes in their institution. The key issue, however, is that volume specification of learning in terms of supervised hours has no pedagogic rationale and is unnecessarily restrictive on course development in that if applied, it is an impediment to the introduction of student-centred approaches to learning. This may be one reason for the finding that PBL is less well established in pharmacy undergraduate education than in medical and nursing education where the approach to learning is left to the educational provider.

Inspite of the potential limitations imposed by the taught hours requirements, schools of pharmacy were using a wide range of learning methods, particularly in terms of coursework, and there were examples of innovation in teaching and learning methods. All schools were using problem solving within the learning process and five claimed to be using PBL. However, there was little evidence that pharmacy as a subject had any impact upon the wider educational community in its use of PBL and no schools were listed by the LTSN generic centre as employing PBL. While PBL is only one approach to the development of self-dependent learners there is extensive experience of its use in medical education. It can also help achieve many of the characteristics that are desirable in a modern health professional since it involves students in the engagement with complex situations presented to them and requires them to decide what information they need to learn and what skills they need to gain in order to manage the situation effectively. There was widespread interest in its application to pharmacy but concerns over the work threshold – which in a relatively small discipline is significant. One approach might be to encourage co-operative working. Our study suggests that the interest is there but that a catalyst is required. Liberation of schools from the volume indicators would be an important step but there may be room here for proactive involvement of the RPSGB with schools to initiate a national approach.

Both recent government policy[3,6,37,51,54] and reports into failures in health professional performance,[14-16] 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 GMC's requirements for undergraduate medical education[48] make explicit reference to the need to develop knowledge, skills and attitudes. Respondents in the schools of pharmacy were generally supportive of the concept of a Knowledge, Skills and Attitudes Framework for pharmacy education provided that this was not prescriptive. We have found widespread evidence that programmes had a strong knowledge focus and that most schools

had a well developed approach to generic skill development (other than management skills). These positive qualities are reflected in the excellent sector scores for pharmacy in subject review. However, there was little developed thinking about subject specific skills for modern pharmacy practice and school respondents struggled to identify the attitudes and values that should be developed by pharmacy undergraduate education. In the majority of courses the emphasis was upon the skills that underpin compounding and supply and so reflected procedures and process rather than clinical or professional qualities. We would suggest that this is a critical area for pharmacy undergraduate education. The progressive transition of pharmacy from a technical to a clinical profession necessitates a fundamental review of the key pharmacy specific skills and of the values and attitudes that future pharmacists must share in common. We will return to this issue below in relation to assessment.

9.3 Assessment

In all schools there was a heavy focus upon formal examinations, particularly in the first three years of study. However, schools were also using a wide range of course work assessment and there was evidence of innovation and experimentation. 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 (e.g. project, practice, science). While diversity in approach has many advantages, this may be an area for consideration since it means that degree classification cannot be assumed to reflect the same graduate abilities and attainments in all schools.

However, perhaps the most significant issue in relation to assessment was that most respondents had difficulty in articulating any planned approach to the assessment of clinical or professional competence. Indeed, the primary emphasis upon professional competence appeared still to be the examination of pharmacy law and dispensing and much of the emphasis was therefore upon the measurement of knowledge or behaviour rather than attitudes or approach. This at least partly arises from the accreditation requirements for pharmacy in which currently the only mandatory requirements for professional competency are linked to dispensing and pharmacy law[2]. Further evidence for concern was the finding that the majority of staff and students did not consider that current assessment methods measured the full range of skills necessary for practice as a pharmacist. There are many reasons for this and several staff respondents pointed out the difficulty of developing and assessing practice competencies when the education process is largely devolved from practice.

Fitness to practice is currently a key issue in health professional regulation. In our view the primary challenge for pharmacy is to define more clearly the essential core attainments that must be achieved at the point of professional registration and then to consider the contributions that must be made by the degree providers and by the preregistration process. There was no doubt that the perceived lack of integration between the undergraduate degree and the preregistration process was one of the key difficulties for educators. In our view this is compounded by lack of sufficient clarity on the key outcome skills and qualities for pharmacy and their linkage to competence and performance. Work is in progress in the essential competencies for professional practice as a pharmacist.[56 57] Our findings indicate the need to extend this to include professional performance and its assessment within the pharmacy undergraduate degree and professional registration training.

9.4 Specialist Elements of Teaching and Learning.

9.4.1 Multi-professional Learning

There is strong government support for the benefits of multi-professional learning.[51] The present study showed support for the concept within schools but limited uptake. However, there were some examples of innovative practice and six schools had multi-professional learning, all of relatively recent origin. Staff with direct experience of this activity identified one critical success factor - expert and detailed planning of the process which took account of the learning

needs and aspirations of all participants. A range of barriers were identified; most linked to resource, access and staffing. A problem for many schools was that they were located in institutions with no medical education – a consequence of the historical origin of pharmacy education in the technical education sector. However, some of the current activity needs much more detailed evaluation since some of the schools that are active in this arena were in such institutions.

9.4.2 Placement Education

Another key policy driver for health professional education is placement learning - or learning in practice.[40] The current RPSGB accreditation requirement is for some contact during the programme but there is no specification of the extent or the nature of the placement.[2] 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. However, placements present a huge challenge to the NHS even when there is direct NHS funding of the educational programme. Therefore the finding that all schools were providing formal teaching in hospitals is commendable and it is not surprising that the length and nature of the placement varied. Only two schools were organising placement teaching in community pharmacy and the common experiences were difficulty with logistics and with obtaining sufficient co-operation with the private sector owners of community pharmacies. This emerged as a real barrier for many schools and is a challenge to the profession. Support for the education is a key component of Good Medical Practice (GMC).[49] We would suggest that for the future development of professional pharmacy education, this support has to be an obligation that extends from the individual professional to the corporate operator.

Overall, as might be expected, the key limiting factors for all placements were again resource, staffing and access. The lack of any explicit funding for pharmacy students from the NHS meant that schools were working with local NHS Trusts in an *ad hoc* way to meet the students' needs. Two schools had negotiated local arrangements with the Workforce Development Directorates and this provided funding for clinical teachers within trusts. Both had increased placement provision across their programmes and the models were indicative of the way in which NHS funding might facilitate clinical pharmacy education. However, neither of these schools was confident that their model was sufficiently robust either to accommodate possible future demands or to resist pressures for change within the local strategic health authorities. The overriding issue that emerged was the need for national recognition of the need for practice-based placement education in pharmacy coupled with an explicit and secure funding stream to enable its implementation. However, the activity that is taking place could provide the evidence base to secure such funding.

9.4.3 The Research Project

Pharmacy is unusual within the health professional community in that the professional accreditation requirement is that all undergraduates complete a "significant" research project. This is another requirement based upon the recommendations made in 1994 of the EU advisory group on the "organisation and structure of training at higher-education institutions". The present study confirmed that all schools met this obligation but also showed considerable variation in the form, length and assessment load associated with the project. There was also much variation in the preparation for the project in terms of formal training in research methods – not directly mentioned in the accreditation requirements.

Schools were having increasing difficulty in offering individual "significant" projects to the large 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. Resources were a real issue regardless of the area of research and the project was considered one of the most resource-demanding of the learning activities. A number of schools were experimenting with group projects where students had a common area of research. The project therefore involved collaborative working but the

production of an individual final report. Whilst the current requirement persists this approach is worthy of further consideration.

However, in our view the key question is a clearer definition of the purpose of the project. The current accreditation requirement is not articulated in terms of any desired educational outcomes. If the intention is to develop an appreciation and understanding of research methods and to encourage critical thinking then there are well established alternative approaches. The resource and staff issues of continuing individual projects need to be balanced against the increasing demands for clinical and practice education.

9.5 Staffing and Resources

This study is a broad baseline review of pharmacy undergraduate education in 2004. There is evidence of a consistency of approach which itself reflects good communications within the sector and a well developed accreditation system. There are also many strengths including a strong science base and developing use of placements in the professional part of the course. However, the other image was of compartmentalisation - insularity from the general health professional educational agenda, lack of articulation between the undergraduate programme and the preregistration training year and some degree of separation between those staff involved in the practice education and those in the main stream science.

Although not a main focus of this study, the academic workforce was an issue of concern in most schools. The majority could see difficulties in future recruitment of pharmacists and in nearly all schools there was a heavy dependence in the practice area upon part-time staff including teacher practitioners. Staffing issues emerged in relation to many specialised areas of the curriculum such as placement education and the final year project. However, they were not limited to the practice or professional area. School respondents were generally resigned to a situation where most of the pharmacy qualified staff would be within pharmaceutics and pharmacy practice. This reflects market forces at the time of appointment and the fact that fewer pharmacy graduates have entered postgraduate research over the last decade. However it is of great significance for the capacity of schools to deliver an educational experience that maps to the needs of a professional discipline.

The rapidly changing health environment requires flexibility and diversity of provision. It is also placing increasing pressures upon providers in terms of the assurance of professional competence. The picture that emerges for pharmacy is of a system that is constrained by resource and that is compartmentalised in a traditional science funding model separate from mainstream health professional education. The ramifications of this extend to all aspects of the professional course but particularly affect the ability of schools to engage in multi-professional learning and their ability to develop work-based learning through professional placements. Better articulation of the preregistration year and the degree will help in the definition and achievement of professional competencies but we would suggest that joint learning with other health professionals is key to integration of pharmacy within the wider health team. There are clearly challenges for the pharmacy schools in any engagement with Department of Health or NHS funding and a long term concern has been the impact upon the research profile of schools. However the potential educational advantages for the undergraduate course are huge.

In summary, we would suggest that for the RPSGB the key issues for the immediate future are a review of the accreditation process and changes to the preregistration training to ensure its better integration with the undergraduate degree. In the longer term, the academic workforce and access to explicit funding for the clinical components of the degree will be the determinants of the future form of pharmacy education.

9.6 Recommendations for Action

We recommend the following actions:

1. An immediate further review of the accreditation process in partnership with the schools of pharmacy. The key issues for this review should include:
    a. A review of the status of the recommendations of the 1994 advisory committee on pharmacy education and in particular the volume indicators for formal contact and the requirement that all students complete a significant final year research project.
    b. Definition of the core pharmacy outcome qualities and standards that relate to professional fitness to practise. This will require review of the preregistration training process (see below).
    c. Fundamental review of the balance between requirements that relate to process and those that relate to the educational endpoints of the degree.
    d. Clearer specification of the core educational process so as to encourage diversity, choice and good practice.
    e. A comprehensive review of criteria relating to practice based learning to provide a clearer definition of the learning objectives which must be carried out in parallel with discussions on funding.
2. 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. This must include a significant input from the schools of pharmacy and from educationalists associated with preregistration training.
3. A review of the obligations of individual pharmacists and corporate operators to support the education of health professionals including pharmacists.
4. Formation of a joint working group between the RPSGB and the schools of pharmacy to develop a forward strategy with respect to the academic workforce and the access of additional funding to support the work-based clinical education of pharmacy undergraduates.

This study has also identified a number of areas for future educational research that impact directly upon the development of pharmacy undergraduate education. In all cases there is widespread interest within schools with some involvement in most schools. We recommend that in each of these areas, there is a need for more detailed research on current practice to inform development across the sector.

1. Student centred learning.
2. Problem based learning.
3. The wider dimension of developing attitudes, values and beliefs within the overall education and training process for pharmacists.
4. Professional performance and its assessment.
5. Multi-professional learning.
6. Placement education.

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Appendix I: Methodology Report

1. The Project Design

1.1. Aim

The aim of the study was to undertake a comprehensive and systematic assessment of the current approaches to teaching, learning and assessment in UK schools of pharmacy.

1.2. Objectives

1. To document the variations in approach to curriculum design and organisation across UK schools of pharmacy.
2. To document the teaching, learning and assessment (TLA) methods used to deliver the curriculum.
3. To determine the attitudes and views of key staff responsible for the learning environment on current and potential developments in curriculum and TLA strategies.
4. To measure the extent of, and methods for, multi-professional learning involving pharmacy undergraduate students.
5. To measure the extent of and variety of approaches to, placement education (formal education in the health professional workplace).
6. To obtain insight into students' experiences of key elements of the TLA strategies identified in 1 above.
7. To document student views of the value of key elements of the TLA strategies.
8. To identify examples of good practice and methods to support their introduction and dissemination within the schools of pharmacy.
9. To make recommendations for future research on TLA within pharmacy education.

2. Methodology

The study has used a pluralistic design. By triangulation of the data sets we have been able to cross check information for validity and where possible, accuracy. Four main methods were used and these are described in more detail below:

a) Desk research using school documentation.

b) Face to face semi-structured taped interviews in each school of pharmacy with the programme leader (or equivalent) and a senior academic in pharmacy practice.

c) Focus groups with participants at BPSA Annual Conference.

d) Survey of school students, in their final year.

2.1 Desk research using school documentation

The documentation obtained via the school website or requested by email was:

1) Programme specification.

2) Module specifications or Detailed Syllabus.

3) Student handbook.

4) Year timetables.

5) Section 4 of the last accreditation submission.

It was not possible to obtain every document from all schools by this approach, but gaps in information were followed up. Data from each school was entered into Microsoft Excel. The framework for collating the school documentation information was:

a. Classification by 9 categories:

Pharmacology.
Pharmaceutics.
Medicinal chemistry.
Microbiology.
Clinical/therapeutics.
Practice/dispensing.
Skills.
Research project.
Options.

b. Description of the contact hours for each module by teaching method:

Lecture.
Directed study.
Practicals/laboratory work.
Workshops.
Tutorials.
Computer Aided Learning (CAL).
Seminars.
Review.
Experiential Learning.

c. Calculation of the number of credits by subject area by year.

d. Calculation of the number of contact hours by delivery method.

e. Summary of the time and method of assessment per module by year.

The data was entered into Excel spreadsheets, checked for anomalies and where appropriate presented in tabular format.

2.2. Face to face semi-structured taped interviews with school staff

Heads of schools of pharmacy were asked to identify two staff members for interview; one the member of staff with overall responsibility for the MPharm programme and one a senior staff member in pharmacy practice. This was to provide cover for the range of questions relating to the programme, teaching and learning in the professional area and interface issues with the RPSGB and the external profession. Twenty four in-depth semi structured interviews were held in all 16 schools. Eight involved two separate interviews but, in response to requests from schools, a further 3 interviews were conducted with both the programme leader and the pharmacy practice staff member. In five cases a single interview was performed because the programme leader was also the senior lead in pharmacy practice. A total of 29 staff were interviewed between 18th May 2004 and 11th February 2005. Sections of the semi-structured interview schedule were based around the RPSGB accreditation documentation, standard QAA audit areas (e.g. curriculum, teaching and learning) and the conceptual plan for the project (see context in the introduction). Two interview schedules were designed: one for the programme leader (appendix II, page 85) and one for the lead in pharmacy practice (appendix III, page 88). A short section on learning methods was also developed for use with one or other of the staff members (appendix IV, page 91). Where one interview was conducted, the same schedules were used omitting any duplication of questions between the two main schedules. The key areas were:

1. Curriculum design
2. Curriculum delivery
3. Teaching and learning
4. Assessment
5. Professional relevance
6. Multi-disciplinary learning
7. Optional studies
8. Research Projects
9. Professional/clinical placements
10. Best practice and innovation

Interviews were taped and transcribed. The common analytical framework consisted of three stages of data reduction: a standard table indicating core issues for all school for each topic (to give the overall picture), followed by a written summary of material in common – a general overview and then a third section which focused on key differences or problems raised.

On reflecting upon the interview experience, the interviewers commented on the variation between school in 'who knows what' about the degree and its contents. The job title of those interviewed is interesting in itself. It covers all levels, from lecturer in pharmacy practice, head of educational development, senior teaching fellow in clinical pharmacy to Director of Undergraduate Studies. So, in future studies this needs to be borne in mind.

2.3 Focus groups with participants at BPSA Conference

Focus groups were held with students at the 2004 BPSA Annual Conference. The focus group theme plan was designed to cover undergraduate experiences of teaching and learning within their school. It matched the semi-structured staff interview structure, but was adapted by each facilitator as required to allow for varying experiences across the four years. Each participant signed a consent form and was given a £10 token, via the BPSA. Six focus groups were completed, involving 44 participants from 9 schools.

The sessions were recorded, tapes were transcribed and analysed by theme. Although the purpose of this phase was to inform the survey design, there is a separate report available on the focus groups.

2.4 Survey of year 4 pharmacy students

The student self completion survey questionnaire was designed to cover the same topics as the other phases of the study, taking up key areas of teaching, learning and assessment. Material from the focus groups informed the range of options in the 15 pages, 31 questions; most questions were closed.

2.4.1 Administration

The survey questionnaire was sent to a named contact in each school for information prior to setting up the survey. The survey questionnaire was re-piloted and posted mid September 2004 to all schools of pharmacy.

The process of administration varied across the schools.

- 11 schools provided us with final year class list. We sent them named labelled envelopes, to track respondents.
- 2 schools wanted sealed numbered envelopes. The school wanted to do their own tracking.

- 1 school had 2 methods because students were on two different programme modes. For students on a conventional four-year degree, questionnaires were distributed via the school using the named student internal method. For those on a five-year sandwich mode, the school supplied the names, we labelled envelopes, the school added the addresses and then posted the survey out.
- 1 school distributed unmarked questionnaires during a lecture.

The variable administration approach is a result of different requirements by the schools. It is not ideal in textbook terms, but is a pragmatic response to complexity. The main implications were the loss of opportunity to follow up non responders to boost the response rate.

2.4.2 Follow up and final response rate

Where the initial response rate to the survey was less than 50% school were asked to administer a second round. However, there was noticeable resistance to the amount of work involved. The cut off date precluded any further follow up activity.

The final response rate by the end of March, after a one month extension of the deadline, from 1847 students was 50.62% (n=935). Response rates by school varied from 14.42% to 84.62%. Although the study was designed to cover all 'old' schools within the UK, the exclusion of Northern Ireland from the student survey and the variability of the rates from nations indicated a sub analysis of England and Wales separately from Scotland would be useful.

2.4.3 Analysis

Data from the questionnaires were analysed following coding and entry into the Statistical Package for Social Sciences Version 12 (SPSS). Valid responses were used throughout the results section. Non-parametric statistical tests were applied to the nominal data and where applicable, the continuity correction for Pearson's chi-squared test was employed to investigate whether there was a statistically significant association between variables. Full statistical analysis of the data is beyond the scope of this summary report.

2.4.4 Ethical approval

The survey questionnaire was approved by Aston University Ethics Committee. Only two other schools required additional institutional approval prior to distribution.

3. Limitations to the survey

The survey instrument was piloted several times with undergraduates to ensure validity and reliability. It was peer reviewed by the steering committee and screened by the named contact person in each school and sometimes the School Board or equivalent.

Validity is also determined by the final response rate. The absolute response rate of 50.62% is disappointing, but not unexpected from our experience of trying to make relationships in order to administer the survey. In real terms of the quantity of responses from each school, ranging from 15 to 176, there are two clear outliers (see table A-I). For a national project of this size to succeed it does need the active support and involvement of a key stakeholder in each school. In this case there was support but not in all cases of a proactive nature.

The mode of administration of questionnaire was also important. We decided not to use a web based approach. There is a growing body of research which compares methods of survey administration to higher education students. Aldridge and Rowley[1] (1998) compared two modes of administration: electronic and paper form. The authors obtained a higher response rate from the tutor delivered paper approach than electronic. A systematic study from the USA points to

[1] Aldridge, S. Rowley, J. (1998) Measuring customer satisfaction in higher education, Quality assurance in Education 6, 4: 197-204.

varying response rates; most studies reviewed showed paper and pencil surveys achieved higher response rates among college students than online surveys[2] (Sax *et al* 2003).

Table A-I: School responses (N)

School	Responders (n)
A	50
B	77
D	60
E	36
F	40
G	27
H	51
I	30
J	76
K	15
L	76
M	75
N	70
O	176
P	76

The highest responding school to this survey were those where questionnaires were handed out to undergraduates to complete - the lecture completion method - as predicted by Audin and co-workers.[3] However, readers should note that survey response rates are falling in all fields of research, within university studies, in pharmacy practice and in surveys of the NHS patients, as illustrated by the examples in Box A-I.

Box A-I: examples from literature of response rates from students, pharmacy and the general public.

Within Aston Business School the ABS Widening Participation Study self completion survey questionnaire, sent out all 412 first year students achieved a 20% response.[4]

The University of Leeds University Quality of Life and Learning survey of 3667 students achieved a 22% response rate to the first survey, and 41% response rate to the second survey after learning the administration lessons from the first round.[3]

The NHS Picker Patient Experience survey achieved a 65.67% response.[5]

In pharmacy practice research a study of pre registration pharmacists in London, Eastern and South east coats regions perceptions of readiness to undertake clinical pharmacy activities had 42.7% response rate.[6]

[2] Sax ,LJ. Gilmartin, SK. Bryant, AN (2003) Assessing response rates and non response bias in web and paper surveys, Research in Higher Education 44 (4): 409-432

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[4] Higson, H. Li, Nai. Jha, S. (2003) Widening Participation 2002-2003. Research and design of programmes that attract and fulfill the needs of Britain's ethnic groups, Birmingham: Aston Business School.

[5] Jenkinson, C. Coulter, A. Reeves, R. Bruster, S. Richards, N. (2003) Properties of the Picker patient Experience questionnaire in a randomized controlled trial of long versus short form survey instruments, Journal of Public Health Medicine 25:197-201

[6] Davies, JG. Bates, I. Healey, R. Webb, DG. McRobbie, D. (2004) Fit for Purpose? IJPP 12: supplement R17

Data skewing or potential bias

A high response rate is needed to avoid bias introduced by non responders. In this case the response rate varied widely from a minimum of 14.42% to a maximum of 84.62%. So it is the variable response rate that causes concern. Since it was not the intention of the study to make comparisons between school, (although individual survey results have been fed back to each school), but to present a national picture, there is a problem of under-representation of data from some schools.

4. Profile of respondents

It is difficult to access a comparable data set. We have provided two comparisons – the UCAS 2004 data set for applications to pharmacy and the RPSGB 2004 census data. The latter is of less value since it compares across the whole of the register and there is known to be marked differences in gender balance and ethnicity with registration year. The UCAS data set includes all applicants in a single year and is more comparable. Comparison with this data set suggests that the respondents were over-represented in women (Table A-II) and that the overall ethnicity profile is skewed by Asian Chinese students from one school (Table A-III).

Table A-II: Gender of respondents

Gender	TLA survey	UCAS 2004	RPSGB census 2004 (older patterns)
Male	25%	36%	47%
Female	75%	63%	53%

Table A-III: Ethnic profile main groups only (not all sources use the same ethnicity category)

Ethnicity	TLA survey	UCAS 2004	RPSGB 2004 census
White	52%	40%	79%
Black (all)	5.3%	10%	2%
Asian India Pakistan Bangladesh	22.5%	40%	14.5%
Asian Chinese	12%.	2%	3%

Appendix II: The Interview Schedule for Programme Leaders

TLA PROJECT: QUESTIONS FOR THE PROGRAMME LEADER

CURRICULUM

1. Design

1. Do you have a teaching and learning strategy for pharmacy — if so what is it and how do you communicate it to staff and students. (CHECK we have a copy).
2. How is the overall curriculum and the subject material designed - is there an overall syllabus committee, do you have delegation to subject groups and what are they?
3. What are the main external influences on curriculum design (e.g. RPSGB accreditation, QAA benchmark)? Explore their importance - relative weight, how are they used, how are they gathered?
4. Are there any internal constraints/drivers on curriculum design e.g. requirement for interdisciplinary learning, options, complementary studies. We are interested in non-pharmacy options or studies - how much do they account for, what are they, what choice, when do they occur?
5. How do you balance teaching between the various scientific disciplines and practice and how are decisions regarding balance made. Is the balance reviewed - if so how? Has it changed in the past? How was this dealt with when the MPharm was introduced? (In Scotland, since the new NQF came into being).
6. How have government policies on widening participation and disability influenced curriculum design? Do you anticipate further changes?

2. Delivery

1. What are the institutional requirements for delivery of the curriculum - modular scheme, semester, standards on hour of delivery? Do these present any particular difficulties for the pharmacy programme - are there any special provisions in force? (CHECK - we have paper version of modular scheme).
2. Have changing student numbers had any influence on delivery of the programme - if so what?
3. Is any part of the curriculum common with that for other programmes of study -if so how was it developed, how is it reviewed and how do the various users interact (CHECK - we have written documentation).

TEACHING AND LEARNING

1. Firstly teaching and learning - could you summarise the how many formal contact hours you have in each year of the programme. (CHECK that we have written details).
2. How do you decide the style and amount of formal teaching - is it left to individual staff, to module leaders or is it decided centrally within the programme?
3. How do you meet the EU directive requirements for 3000 hours of total study of which 35% is practical work? How do you define practical work?
4. Is there any University definition of total student learning in place - i.e. contact plus directed study and self study? What is it? (CHECK we have written information).
5. We are interested in the balance between didactic teaching and student centred learning. Do you have any guidelines that apply across the whole programme? Do you have any

policy with regard to the encouragement of “deep learning” - is this at a programme level or at module or course unit level?

6. We are interested in problem based learning.
   a. What do you consider to be problem based learning - what is it?
   b. Do you make use of problem based learning?
   c. If so, where in the syllabus?
   d. Can you talk us through how it is organised and assessed (CHECK that we have documentary information about it).
7. Do you have a standard definition of “directed student learning”? Do you have any guidelines on the balance between student centred learning and formal teaching?
8. How do you support students for student centred learning — how do you ensure they build the skills for self learning?
9. How do you balance skills/knowledge aspects of the curriculum? We are interested in how you plan skill development within your curriculum. How do you develop generic skills - we are particularly interested in
   a. Communication skills
   b. Interpersonal skills
   c. Quantitative skills
   d. Management skills e.g. influencing skills, time management
   e. Professionalism
10. Have you any definition of the attitudes that you would wish to develop through the programme?
11. Would there be any value in having a national knowledge/skills/attitudes framework for undergraduate pharmacy education?
12. A key element of the pharmacy benchmark is the development of graduates with the capability to self-learn (undertake CPD). What is your approach to this?

Specific Teaching and Learning Areas (see separate question set)
These may be asked of the Programme leader or the Head of Pharmacy Practice.

ASSESSMENT

1. Can you talk me through your assessment scheme for the pharmacy degree? (CHECK that we have written documentation covering this).
2. How do you assess skill development - particularly the generic mentioned above?
3. How do you calculate the final degree classification - what element comes from study prior to year 4?
4. How have you ensured that your curriculum achieves the M-level requirements of the pharmacy benchmark?
5. Do you use a personal development portfolio as part of your assessment method? If so details.
6. How do you provide feedback to students on their progress? What sort of formative assessments do you use and when?

7. Could you tell me whether you involve peer assessment (students of students)? If so, when is it used, in which syllabus areas and how is it organised?
8. We are interested in an overview of the success of student on pharmacy programmes. We would like some information on
   a. Intake qualifications of your students
   b. Attrition - % loss of students due to academic failure and to personal reasons, where does this occur (year) and do you see any trends?
   c. Outcome statistics — degree classifications
   d. Any other performance indicators used in the school to monitor success of graduates.
   e. Any influences on success e.g. WP policy, disability?
9. Finally a couple of general questions on assessment -
   a. Do you think the volume of assessment on the degree programme is right?
   b. Do you think the assessment measures the full range of qualities necessary to practise as a pharmacist? If not, why not?

PROFESSIONAL RELEVANCE OF THE PROGRAMME

1. These questions are about pharmacy as a health professional course. What account do you take of the education process for other health professionals in developing your curriculum and teaching methods (e.g. the QAA framework for health professional education - awareness; medical and nursing education)?
2. What are the mechanisms within your school for maintaining the relevance of the programme to pharmacy practice?
3. What knowledge do you have of the new preregistration curriculum and assessment methods? Do you plan your programme so that it articulates with the preregistration process - if so how? If not, do you think it should be so planned and what prevents you from doing it?
4. Do you think that the RPSGB involve schools of pharmacy sufficiently in ensuring a seamless transition between the undergraduate programme and preregistration? If not - what could be done?
5. How many registered pharmacists do you have on your staff? What are their areas of teaching - we are interested in the main subject divisions of chemistry, pharmaceutics, practice, pharmacology, any other e.g. medical micro? How many external practicing pharmacists are involved in teaching - in what? Do they have any input into curriculum design and the teaching and learning strategy?

BEST PRACTICE/INNOVATION

1. Finally we are interested in examples of good practice — what do you think distinguishes your school from others?
2. Do you have any specific examples of innovation in curriculum, in teaching and learning or in assessment?
3. What do you think distinguishes your university from others and how does it influence pharmacy?

Appendix III: The Interview Schedule for Staff in Pharmacy Practice

TLA PROJECT: QUESTIONS FOR THE HEAD OF PHARMACY PRACTICE

CURRICULUM

1. We are particularly interested in the processes involved in the design and review of your pharmacy practice curriculum.
   a. How do you define pharmacy practice in your school - does it include clinical?
   b. What do you mean by clinical studies?
   c. If it does not include clinical, what are the interactions between the practice group and the clinical group? (CHECK that we have documentation describing both the practice and clinical courses).
2. Within your school, how do you balance teaching between the various scientific disciplines and practice and how are decisions regarding balance made. (CHECK we have a detailed description of the curriculum).
3. Are you happy with the current balance - any plans for change or development in the future?
4. Can you describe what account you take of the RPSGB accreditation requirements documents and the QAA benchmark statement in designing your curriculum?
5. Do you think that the specifications within the RPSGB document are sufficient - would there be any value in having a more defined knowledge and skills map related to practice?
6. Are there any other external influences that affect your curriculum? We are interested in how you maintain currency and relevance of the practice component.
7. Do you have any formal or informal consultation mechanisms?
8. Are there any internal factors within your institution that influence the practice curriculum e.g. requirement for interdisciplinary learning, options, complementary studies. (CHECK - that if special requirements apply we have details).
9. Could you describe the philosophy of your practice/clinical teaching over the four years of the programme (what happens where, year themes). (CHECK that we have documentation).
   a. Where do you teach dispensing — and how is this developed over the programme?
   b. Where and how do you teach pharmacy law and ethics?
   c. Do you teach wider ethical issues e.g. those relating to health care, medical ethics etc?
   d. How do you approach professional teaching in the final year — practicals revision in law?

TEACHING AND LEARNING

1. Firstly teaching and learning - could you summarise how many formal contact hours you have for practice/clinical in each year of the programme. (CHECK that we have written details).
2. How do you decide upon the teaching and learning strategy for practice - is it left to individual staff, to module leaders or is it decided centrally within the programme?
3. We are interested in the balance between didactic teaching and student centred learning. In practice, do you have any policy with regard to the encouragement of deep learning?
4. Do you make use of problem based learning? If so, where in the syllabus? Can you talk us through how it is organised and assessed (CHECK that we have documentary information about it)
5. How do you support students for student centred learning — how do you ensure they build the skills for self learning?
6. How do you balance skills/knowledge aspects of the practice curriculum? We are interested in how you plan skill development within your curriculum. How do you develop generic skills - we are particularly interested in:
    a. Communication skills
    b. Interpersonal skills
    c. Quantitative skills
    d. Management skills e.g. influencing skills, time-management
    e. Professionalism
7. Have you any definition of the attitudes that you would wish to develop through the programme?
8. Would there be any value in having a national knowledge/skills framework for undergraduate pharmacy education?
9. A key element of the pharmacy benchmark is the development of graduates with the capability to self-learn (undertake CPD). What is your approach to this?

ASSESSMENT

1. We are interested in your approach to assessment — and the balance between assessment of knowledge and of skills. Can you talk us through the assessment methods used in the practice component of the programme (CHECK we have documentary details).
2. We are interested in how you assess skill development in the practice arena. Can you talk us through how you measure the achievement of generic skills and subject specific skills? Do you have any special assessment procedures?
3. A key question in health professional education is the determination of clinical competence.
    a. How do you define competence in relation to entry to the preregistration year?
    b. Is there a need to review the national accreditation requirements here?

4. Within the pharmacy curriculum we are required by the RPSGB to assess competence in dispensing and in law and ethics. Can you tell me how you approach this within your curriculum? Where is it done, what methods of assessment are used?
5. What do you think are the key skills and attitudes that you wish to develop in a pharmacy student? How do you approach their assessment?
6. We are interested in your use of a number of assessment methods. For each of the following could you say whether you use them in practice assessments and if so, how.
   a. Peer assessment
   b. Group work assessments
   c. Oral examinations
   d. Video assessments
   e. OSCEs
   f. Practice based assessments (i.e. in hospital, community)
7. Finally a couple of general questions on assessment -
   a. Do you think the volume of assessment on the degree programme is right?
   b. Do you think the assessment measures the full range of qualities necessary to practice as a pharmacist? If not, why not?

PROFESSIONAL DEVELOPMENT

1. What arrangements do you have for teaching in practice - i.e. within pharmacy (CHECK that we have documentation)?
2. How is this phased over the programme? We are interested in the total number of hours of placement teaching in each year of the programme per student.
3. How do you supervise this? What is the involvement of external staff
4. What are your learning outcomes for placements and how do you assess them?(CHECK that we have documentation)
5. What plans do you have for developing placement teaching? What are the barriers? How are you working to overcome them?
6. How many teacher practitioners do you have to support professional placements —and who funds them?
7. Do the company funded TPS (Boots, Lloyds etc) have any involvement in placements within community pharmacy — if so what?

BEST PRACTICE/INNOVATION

1. Finally, we are interested in examples of good practice — what do you think distinguishes your school from others?
2. Do you have any specific examples of innovation in curriculum, in teaching and learning or in assessment?
3. What do you think distinguishes your university from others and how does it influence pharmacy?

Appendix IV: Special Topics Interview Schedule

SPECIAL AREAS OF TEACHING AND LEARNING

There are a number of aspects of teaching and learning that we would like to explore in more detail and the following questions will cover this.

MULTIDISCIPLINARY LEARNING

1. Firstly. can you outline any arrangements that you have for multi-disciplinary learning? (CHECK make sure that we have documentation). What have been your experiences - good points, problems, constraints?

2. Have you any future plans to develop multidisciplinary learning?

3. What do you think is the value of multidisciplinary learning - what are the disadvantages? This is an aspect of health professional education that interests the DOH - we are interested in your open views on its values, practicality, and barriers.

OPTIONAL STUDIES

1. Are there any arrangements in your programme for specialised study e.g. options? (CHECK make sure that we have details). Have you any future plans here?

2. What do you think is the value of optional studies - should they be part of pharmacy education or should it be primarily core (as in RPSGB accreditation requirements)?

RESEARCH PROJECTS

1. Can you outline your philosophy with regard to development of research awareness/expertise? How is this designed into your curriculum

2. As you know a final year project is mandatory within the RPSGB requirements for pharmacy. We are interested in how you handle projects. Firstly when in the final year do you run projects and how long are they (hours, weeks etc)

3. What is the range of projects that you offer e.g. all subjects

4. Are projects coupled with or supported by any specialised courses e.g. research methods, subject specific options?

5. How do you allocate projects — what is the element of student choice?

6. Do you run “team projects” — projects where several students have a linked project? If so how many, how are they organised and how do you ensure that there is an individual assessment for each student?

7. How many projects are undertaken with external supervisors e.g. in hospitals? How do you manage the quality aspects of supervision?

8. Are the new NHS ethics requirements having an influence upon what you do and how you do it?

9. What is the credit weighting of the project in your programme and what is its contribution to the final year assessment?

10. How do you manage assessment to ensure equity — double marking, moderation etc.

PROFESSIONAL/CLINICAL PLACEMENTS

1. What arrangements do you have for teaching in practice - i.e. within pharmacy (CHECK that we have documentation).

2. How is this phased over the programme? We are interested in the total number of hours of placement teaching in each year of the programme per student.

3. How do you supervise this? What is the involvement of external staff?

4. What are your learning outcomes for placements and how do you assess them?

5. What plans do you have for developing placement teaching? What are the barriers? How are you working to overcome them?

6. How many teacher practitioners do you have to support professional placements - and who funds them?

7. Do the company funded TPS (Boots, Lloyds etc) have any involvement in placements within community pharmacy - if so what?

Appendix V: The Student Survey

Royal Pharmaceutical Society of Great Britain

ASTON UNIVERSITY

TEACHING, LEARNING AND ASSESSMENT: THE EXPERIENCE OF PHARMACY UNDERGRADUATE STUDENTS

About This Survey

This questionnaire is part of a larger study of undergraduate pharmacy education that is being undertaken by the Pharmacy Practice Research Group at Aston University on behalf of the Royal Pharmaceutical Society of Great Britain. The aim of this research is to inform future educational planning and the questionnaire is an opportunity for you to influence this agenda. Any responses you give will be anonymous – we are using codes in distribution only for the purpose of response tracking so that we can complete follow-ups.

The survey has the support of BPSA and of the UK schools of pharmacy. It is an opportunity for you to express your views. However, whether or not you participate will have no effect upon either your pharmacy degree or preregistration year.

What To Do

Most of the questions simply require you to tick a reply box. The whole questionnaire can be completed in 20 minutes and we hope that you will help us with this important research.

In the event of queries contact Laura Clarke on clarkeld@aston.ac.uk
Pharmacy Practice Research Group, Aston University, Birmingham, UK.

SECTION A: WORKLOAD

The following questions are about your experience of the MPharm course. Thinking about workload throughout your degree, which of the following options for each question best represents your opinion on that subject area?

Q1.
a) Overall, the volume of work required for the MPharm course is:

TICK ONE ONLY

Nowhere near enough	Not enough	About right	Too much	Far too much
☐	☐	☐	☐	☐

b) I find coping with the amount of work required:

TICK ONE ONLY

Very difficult	Difficult	About average	Easy	Very easy
☐	☐	☐	☐	☐

c) I think the balance of the MPharm course is most adequately described as:

TICK ONE ONLY

Far too much of a focus on pure knowledge	Too much of a focus on pure knowledge	About right	Too much of a focus on relevant skills	Far too much of a focus on relevant skills
☐	☐	☐	☐	☐

SECTION B: TEACHING AND LEARNING

We are interested in your views on teaching and learning in the pharmaceutical sciences (e.g. medicinal chemistry, pharmacology, pharmaceutics and microbiology) and in the practice of pharmacy (e.g. dispensing, law and ethics and therapeutics). For each statement within Q2, please indicate which option best reflects your views by ticking the appropriate box.

Q2.
a) Considering the MPharm course as a whole, the time devoted to the pharmaceutical sciences is:

TICK ONE ONLY

Nowhere near enough	Not enough	About right	Too much	Far too much
☐	☐	☐	☐	☐

b) With regard to material of relevance to the practice of pharmacy, the first year of the MPharm course contained:

TICK ONE ONLY

Nowhere near enough	Not enough	About the right amount	Too much	Far too much
☐	☐	☐	☐	☐

c) Dispensing, law and ethics should be taught in all years of the MPharm course.

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

d) Clinical pharmacy should be taught in all years of the MPharm course.

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

e) I consider that the science content of the early part of the course was necessary for the professional studies in years three and four.

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

Q3. Thinking about methods of teaching, look at the list below and indicate by ticking one box in each section how important each one is for your own learning:

a)	Lectures	Very important ☐ Fairly important ☐ Not important ☐
b)	Scientific Laboratory Practicals	Very important ☐ Fairly important ☐ Not important ☐
c)	Dispensing or Clinical Practicals	Very important ☐ Fairly important ☐ Not important ☐
d)	Tutorials	Very important ☐ Fairly important ☐ Not important ☐
e)	Workshops	Very important ☐ Fairly important ☐ Not important ☐
f)	Directed Study	Very important ☐ Fairly important ☐ Not important ☐

Q4. Thinking about the following practical classes, look at the list below and indicate by ticking one box in each section how useful you have found each type of practical class:

a)	Medicinal Chemistry Practicals	Very useful ☐ Fairly useful ☐ Not useful ☐
b)	Pharmacology Practicals	Very useful ☐ Fairly useful ☐ Not useful ☐
c)	Pharmaceutics Practicals	Very useful ☐ Fairly useful ☐ Not useful ☐
d)	Dispensing Practicals	Very useful ☐ Fairly useful ☐ Not useful ☐

Q5. Next we want you to consider your experience of using information technology (IT) to support learning.

a) In relation to my own learning, access to learning materials on the intranet or virtual learning environment (VLE) has been:

TICK ONE ONLY

Very useful	Fairly useful	No opinion	Not very useful	Not at all useful
☐	☐	☐	☐	☐

b) Which one of the following would be your preferred method for delivery of new material?

TICK ONE ONLY

IT	Both IT and traditional lecture	Traditional lecture
☐	☐	☐

c) Which one of the following would be your preferred method to support your learning of new material?

TICK ONE ONLY

IT	Both IT and traditional lecture	Traditional lecture
☐	☐	☐

SECTION C: ASSESSMENT

This section explores your experience of the assessment of the MPharm course.

Q6.

a) I consider that the amount of formal assessment on my MPharm course is:

TICK ONE ONLY

Too little	About right	Too much
☐	☐	☐

b) I consider that the balance between exams and coursework on my MPharm course is:

TICK ONE ONLY

Too much coursework; not enough exams	About right	Too many exams; not enough coursework
☐	☐	☐

c) I consider that the focus on memorised knowledge on my MPharm assessment process is:

TICK ONE ONLY

Too little	Just about right	Too much
☐	☐	☐

d) I consider that the assessments used in the MPharm course adequately measure the skills necessary to be a pharmacist.

TICK ONE ONLY

Agree	Not sure	Disagree
☐	☐	☐

e) Thinking about your experience of assessment across the whole of your MPharm course, how useful have you found the feedback?

i) On examination performance.

TICK ONE ONLY

Very useful	Fairly useful	No opinion	Not very useful	Not at all useful
☐	☐	☐	☐	☐

ii) On performance in coursework.

TICK ONE ONLY

Very useful	Fairly useful	No opinion	Not very useful	Not at all useful
☐	☐	☐	☐	☐

SECTION D: OPTIONS

Some MPharm courses allow students to choose options from outside the main subject area. We are interested in your views on whether such options should be available.

Q7. Select the one statement below that best summarises your views on option availability.

Regarding options, I think that the MPharm course should:

a)	Comprise entirely core, set subjects with no element of choice.	☐
b)	Have options available, but only from within pharmacy subjects.	☐
c)	Have options available, but only from within non-pharmacy subjects.	☐
d)	Have options available from both pharmacy and non-pharmacy subjects.	☐

SECTION E: INTER-PROFESSIONAL LEARNING

Inter-professional learning is a term used to describe the process of members of different healthcare professions learning together.

Q8. During your four years' study, have you had any inter-professional learning with other health professional students within:

		Yes	No
a)	Lectures	☐	☐
b)	Workshop/Tutorial	☐	☐

If both answers are No,
GO TO Q11 ⟹

Q9. If you have studied with other health-professional students, please indicate which categories were involved:

TICK ALL THAT APPLY

a)	Medical students	☐
b)	Student nurses	☐
c)	Dental students	☐
d)	Other health professionals allied to medicine (e.g. physiotherapists; optometrists; audiologists; social workers; occupational therapists) If yes, specify which: _____	☐

Q10. How would you assess your experience of inter-professional learning?

TICK ONE ONLY

Very useful	Moderately useful	No opinion	Not useful	Not useful at all
☐	☐	☐	☐	☐

Q11. What do you think was the one major advantage and the one major disadvantage of inter-professional learning?

a) Advantage: (please specify) _____

b) Disadvantage: (please specify) _____

Q12. How strongly do you agree with the statement that "joint learning with other health professional students should be a requirement for all undergraduate degrees in pharmacy"?

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

SECTION F: PLACEMENTS

Now we have some questions about professional placements. By 'professional placement' we mean a period of practical experience in a pharmacy or clinical setting that is an integral part of your MPharm course – for example, a visit to a hospital pharmacy. We are not asking about vacational work in a pharmacy that you organise yourself.

Q13. Have you had any formal experience of placements?

Yes	No
☐	☐

If answer is No,
GO TO Q16 ⇒

Q14. If you have experience of placements during your MPharm course, write in the appropriate box below the duration of the placement(s) in total hours:

		First year	Second year	Third year	Fourth year
a)	Community				
b)	Hospital (pharmacy)				
c)	Hospital (ward-based)				
d)	Industry				
e)	GP Practice				
f)	Other (specify below)				

Other: _____

Q15. To what extent was your professional placement(s) a good learning experience?

TICK ONE ONLY

Very Good	Good	Fairly Good	Not very Good	Not at all Good
☐	☐	☐	☐	☐

Q16. How strongly do you agree with the following statements?

a) "Professional placements should be compulsory in at least one year of study"

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

b) "Professional placements should be compulsory in all years of study"

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

SECTION G: RESEARCH PROJECTS

It is a requirement of the RPSGB that all pharmacy students conduct a research project as part of their MPharm course.

Q17. How important do you think it is that there should be a research project in the MPharm course?

TICK ONE ONLY

Very important	Fairly important	Not sure	Not very important	Not at all important
☐	☐	☐	☐	☐

Q18. Do you think there was enough choice in terms of the research project topics that were available to you?

TICK ONE ONLY

Yes	Not sure	No
☐	☐	☐

Q19. Do you consider that your training in research methods provided a good foundation for your research project?

TICK ONE ONLY

Yes	Not sure	No
☐	☐	☐

SECTION H: INFLUENCES ON YOUR FUTURE CAREER

The following questions relate to your attitudes towards your future career.

Q20.

(a) Did you study pharmacy in order to become a pharmacist?

Yes	Not sure	No
☐	☐	☐

(b) Do you still want to be a pharmacist?

TICK ONE ONLY

Yes	Not sure	No
☐	☐	☐

Q.21

a) If yes, have your studies reinforced your pharmacy career ambitions?

TICK ONE ONLY

Yes	Not sure	No
☐	☐	☐

b) If not sure or no, explain:

_____

_____

Q22. Overall, thinking about your future practice as a graduate, how confident are you that you will have the necessary:

a) knowledge?

TICK ONE ONLY

Very confident	Fairly confident	Not very confident	Not at all confident
☐	☐	☐	☐

b) personal skills?

TICK ONE ONLY

Very confident	Fairly confident	Not very confident	Not at all confident
☐	☐	☐	☐

c) practical skills?

TICK ONE ONLY

Very confident	Fairly confident	Not very confident	Not at all confident
☐	☐	☐	☐

d) professional attitude and behaviour?

TICK ONE ONLY

Very confident	Fairly confident	Not very confident	Not at all confident
☐	☐	☐	☐

SECTION I: STUDENT PERCEPTIONS

The following statements have been made by undergraduate students currently on MPharm courses.

Q23. Indicate your agreement with each statement by selecting one of the options below:

a) 'I think the First Year is all about what you did at A-Level, and it's just basically a bit further up'

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

b) 'The First Year is really quite irrelevant to the rest of the degree'

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

c) 'Pharmacy to me seems to just be memorising a lot of stuff and not applying it, it's not like the more interesting side of science where you have to be a bit more creative'

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

d) 'We could do a lot less science I think, I think a lot of it is irrelevant'

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

e) ‘Clinical experience comes too late in the degree, I think it should be through the whole thing’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

f) ‘There should be more pharmacy practice in Year One – to allow continual development of skills’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

g) ‘Time management is a real problem because we’ve got a lot of hours of lectures and practicals and then you’ve got coursework to do on top of that and you’ve got directed study on top of that’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

h) ‘I do believe it’s a very hard degree course, but it’s not hard because it’s challenging, my opinion is it’s hard because there is an enormous amount of it’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

i) ‘I think we seem to have more assessments than other courses’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

j) ‘Assessments don’t measure the skills for being a pharmacist, they just measure your knowledge base’

TICK ONE ONLY

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

And finally, some questions about you.

Q24. Are you: Male ☐ Female ☐

Q25. How old are you?

20	21	22	23	24-29	30-39	40-49	50+
☐	☐	☐	☐	☐	☐	☐	☐

Q26 How would you best describe your ethnic background? Tick one box only.

White	
British	☐
Irish	☐
Other White background	☐
(please state)	……
Black or Black British	
Black Caribbean	☐
Black African	☐
Any other Black background	☐
(please state)	……
Dual Heritage	
White and Black Caribbean	☐
White and Black African	☐
White Asian	☐
Any other Mixed background	☐
(please state)	……
Asian	
Indian	☐
Pakistani	☐
Bangladeshi	☐
Any other Asian background	☐
(please state)	……
Chinese or Other Ethnic Group	
Chinese	☐
Any other background	☐
(please state)	……
Don’t want to say	☐

Q27. Which of the following best describes your religion?

Buddhism ☐
Christianity ☐
Hinduism ☐
Islam ☐
Judaism ☐
Sikhism ☐
None ☐
Other ☐

If Other, specify: _____

Q28. Did you work as a pharmacy technician prior to starting your degree?

Yes ☐ No ☐

Q29. Have you had any work experience in pharmacy ?

Yes ☐ No ☐

Q30. What has been your residential status while you have been a pharmacy student?

UK ☐ Other EU ☐ Non-EU ☐

Q31. Which School of Pharmacy do you attend?

Aberdeen (Robert Gordon's)	☐	Leicester (DMU)	☐
Bath	☐	Liverpool (JMU)	☐
Belfast (Queen's)	☐	London (King's)	☐
Birmingham (Aston)	☐	London (school)	☐
Bradford	☐	Manchester	☐
Brighton	☐	Nottingham	☐
Cardiff	☐	Portsmouth	☐
Glasgow (Strathclyde)	☐	Sunderland	☐

Thank you for your time and cooperation. If you have any other comments that you would like to make about your pharmacy undergraduate education, enter them overleaf.

Additional Comments:

Do Not Write Below this line – for administrative use only.