

What purpose does the MPharm research project serve?

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Abstract

In 2004, the Royal Pharmaceutical Society of Great Britain (RPSGB) funded research on teaching, learning and assessment within the UK undergraduate pharmacy degree (MPharm), including the compulsory final year project. Documentary analysis showed that all schools met the project requirement, although there were wide variations in the relative contribution of the project to the final year mark and the degree classification. Interviews with staff revealed that organisation of research projects was complex and time consuming and exacerbated by increasing student numbers and the impact of research ethics. 61% of students, surveyed via a self-completion questionnaire (response rate 50.6%) perceived the research project to be very or fairly important. Whilst 47% considered that they had enough choice of topic and 37% said that their training in research methods provided a good foundation for their project, this suggests scope for improvement. In the UK, there are legislative changes impending which may provide an opportunity to review the future purpose and feasibility of a “significant” final year project within the MPharm.

Keywords: *Assessment, learning, MPharm, pharmacy education, research project, teaching*

Introduction

A “significant” final year research project is a pre-requisite for approval of a UK undergraduate degree in Pharmacy by the professional regulatory body, The Royal Pharmaceutical Society of Great Britain (RPSGB) (Royal Pharmaceutical Society of Great Britain, 2002). The immediate driver for this was the 1994 report by a European expert committee on pharmaceutical education which recommended that all EU pharmacy courses should include a significant final year project lasting from three to six months (Advisory Committee on Pharmaceutical Training, 1994). In 1996, the RPSGB incorporated this recommendation into their accreditation requirements for undergraduate degrees and so made the project mandatory (Royal Pharmaceutical Society of Great Britain, 1996). The terminology used was the same as in the expert committee report and a requirement for the project has been continued within the new accreditation process approved in 2002 Royal

Pharmaceutical Society of Great Britain, (2002). The current requirement, detailed in criterion 5, is that “the degree course includes a significant research project of three to six months duration” and that “the student must undertake the project alone or as his/her individual contribution to a team endeavour”.

Although the 1996 degree accreditation requirements made the project compulsory, widespread inclusion of a project in the UK undergraduate pharmacy curriculum pre-dates this and can be traced to the move to all graduate entry to pharmacy in 1967. In common with other science degrees of the time, a final year research project was introduced in most pharmacy courses in order to underpin developing research activity. By 1986, the growing importance of practice based and clinical research was being recognised and the Nuffield enquiry into pharmacy emphasised the importance of research within the undergraduate curriculum (Nuffield Foundation, 1986). A decade later the report of the 1997 RPSGB Research and Development task force (Royal Pharmaceutical Society of Great Britain, 1997)

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renewed the call for undergraduate pharmacy students to learn research methods which are applicable to pharmacy practice. The Society was advised to “foster an evaluative culture within pharmacy” to ensure that the profession is equipped to operate fully in the evidence based practice culture of the NHS. A key strategic step to making this happen was related to teaching of both practising pharmacists and undergraduates. The report called for formal research training to be provided for practice based researchers and for all practising pharmacists to be helped to become “research aware”. The report noted that schools of pharmacy tended to concentrate more on teaching the natural sciences rather than the vocational application of pharmacy practice and stated that pharmacy practice research should be adequately supported in schools of pharmacy and undergraduate education should enable critical evaluation of all research skills which is relevant to practice.

The extension of the UK pharmacy degree to four years in 1997 to meet the terms of the EU directive on harmonisation of pharmacy education (85/432/EEC) (Council Directive, 1985) coincided with a national move to an undergraduate Masters entry qualification (MPharm). In turn, this placed further emphasis upon research within the undergraduate degree since the subject benchmark statements (Quality Assurance Agency, 2001a,b) in the UK required a higher engagement with research in a Masters level qualification. However, by the late 1990s contrary pressures were also building, not least the increasing student numbers in schools of pharmacy and the reducing unit of resource from government funding.

A more direct threat was posed by the Department of Health Research Governance Framework introduced in 2001 (Department of Health, 2001) and updated in 2005 (Department of Health, 2005) to take account of further changes in national and EU law. This framework applies to all research “concerned with the protection and promotion of public health” including “clinical and non-clinical research, research undertaken by NHS or social care staff using the resources of health and social care organisations” and any research undertaken by “industry, charities, research councils and universities within the health and social care systems”. This wide scope means that virtually all undergraduate projects in pharmacy practice and clinical pharmacy fall within the scope of the framework. The implications are that such research needs full ethical committee approval and must comply with standards of originality, conduct and supervision by appropriately qualified and experienced staff (Jesson & Wilson, 2004).

It was against this background that in 2004, the Pharmacy Practice Research Trust funded the first ever national study on teaching, learning and assessment methods within undergraduate pharmacy education. 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 (16 at the time). The final year research project was one element of this overall study but a significant one in view of its mandatory nature, its significant contribution to the final year and the resource and governance issues surrounding its execution.

Materials and methods

The study used a pluralist methodology; interviews with key staff with schools of pharmacy, a documentary review and a survey of all final year students within schools of pharmacy. All 16 established schools of pharmacy within the UK were contacted and asked to participate in the study. The documentary review was based on student handbooks, timetables and module and programme specifications. The data were extracted and entered into spreadsheets so that aggregate and comparative measures could be collated. This gave measures on the number of hours allocated to the final year projects and by examining the composition of the final degree mark, the contribution to the degree classification made by the final year project could be calculated.

To support the documentary review, semi-structured interviews were undertaken with the programme director and in most cases, a senior member of pharmacy practice staff. These two individuals were chosen because they had the best insight into the MPharm programme as a whole; they were not chosen for their expertise with undergraduate research projects. The interview schedule concentrated on seven themes. One of these was research methods and contained 10 questions. A total of 24 interviews were completed in the 16 schools because in three schools, the staff concerned asked to be interviewed together and in five schools, the programme leader was also the senior member of staff in pharmacy practice.

Focus groups were arranged with students attending the 2004 annual British Pharmacy Students Association (BPSA) conference. The focus groups were recorded, transcribed and analysed and the results used to inform the student survey which consisted of 15 pages containing 31 questions. Most questions in the survey were closed and three related directly to the final year project.

The student survey was piloted both prior to and following consultation with all participating schools of pharmacy and then distributed to all final year students via their school of pharmacy between September 2004 and March 2005. This coincided with the time that most students were undertaking their final year project.

Schools were prepared to participate in the distribution of the student survey only if they could

maintain control over the method of survey administration. The majority (11) schools provided a final year class list and the questionnaires were delivered to these schools in named labelled envelopes for distribution via student pigeon-holes. Four schools used different distribution methods; two distributed to students against their own in-house lists (again via student pigeon-holes) and one distributed the questionnaires during a scheduled teaching session. One school had two 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 (which included their pre-registration training as part of the degree), the school supplied the names, we labelled envelopes, the school added the addresses and then posted the survey to the students. Finally, one school declined to participate in this part of the study. In all schools, one follow up was undertaken to non-respondents.

The overall response rate from the 1847 students in the 15 of the 16 schools who agreed to take part in the study was 50.6%. However, the response rate from individual schools varied from 14.4 to 84.6%.

Results

Time for the project

Analysis of the data from the staff interviews and course documentation indicated that in line with accreditation requirements, all 16 schools of pharmacy required 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 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% ($SD \pm 9.7\%$). The average rated time for a project was 344 h with a range from 183 to 500 h ($SD \pm 90.3$ h). Data for one school were not available.

Contribution to the final degree

There was 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

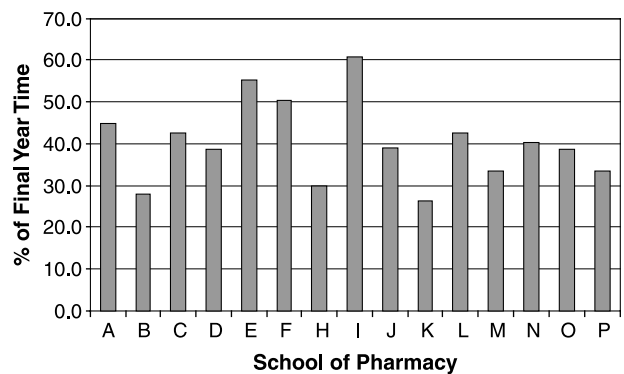


Figure 1. Percentage of the total final year time expected to be associated with the final year research project for 15 schools of pharmacy (A–P).

element was reflected in the credit loading. The data were adjusted to take into account the proportion of the final degree mark that was derived from the final year. Of the 16 schools, two 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 are summarised in Figure 2. On average, 18% of the degree classification arose from the final year project but the range was from 8 to 29% ($SD \pm 6.3\%$). 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.

Assessment

Although there were variations in the contribution of the project to the overall degree, interviews with key staff in schools show 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

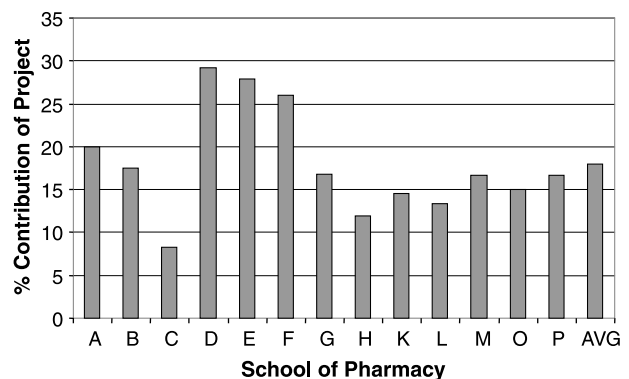


Figure 2. Percentage contribution of the final year project to the overall degree classification in UK schools (AVG denotes the sector average).

external examiners in undertaking a final moderation of the project mark. It was clear from the interviews that staff within schools of pharmacy were very aware of the potential for variations in standards between markers. This problem was compounded by the diverse nature of the project subjects and expertise of the staff.

Formal research methods teaching

There was 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 an “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. (Combined Interview (Programme Director and senior member of staff from Pharmacy Practice), School N).

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. (Combined Interview (Programme Director and senior member of staff from Pharmacy Practice), School O).

The timing of delivering formal training also varied. Students from two schools received formal research training in year three before they decide on a topic, whilst for the remainder ($n = 14$), research training although variable, was given during the implementation of the project. Programme directors were aware 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. (Programme Director, School K).

Student attitudes and experience

A total of 935 students participated in the survey (response rate 50.6%). Response rates by school varied from 14.42 to 84.62%. 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 (37%, $n = 343$) responded that it had whereas 38% ($n = 358$) responded that it had not. A further 25% ($n = 234$) 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 (School E—51.7% ($n = 31/60$); School J—54.9% ($n = 28/51$); School L—56.6% ($n = 43/76$)) and conversely in three schools, over 50% of students considered that their preparation had not provided a good foundation for the project (School A—51.4% ($n = 36/70$); School I—63.0% ($n = 17/27$); School M—73.3% ($n = 11/15$)). Interestingly, all three 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.

Project allocation

There was a range of methods used for project allocation. Almost all staff described trying a number of different approaches and emphasised 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 that placed a large demand upon resources. All respondents emphasised that that increasing numbers of pharmacy undergraduate students in their school had made the process even more complex and time consuming to co-ordinate.

...it's simply the resource available to fund 120 separate individual research projects is not there and so what we're talking about doing is the concept of perhaps two or three students within an area allocated to a common research problem where they would address individual parts of that problem... (Programme Director, School G).

Schools made great efforts to try and ensure that all student had a choice, although it was not possible for all students to get either their first choice of supervisor or of project. Overall, almost half the students considered that they had enough choice in the selection of their research project (47%, $n = 440$)

although just over a third responded negatively to this question (38%, $n = 356$). A relatively small number (15%, $n = 139$) were unsure.

Key concerns of staff

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.

The use of external supervisors in practice locations varied. About 12 of the 16 schools made 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 appeared to happen was that the external supervisor facilitated the project and at best was involved in joint management with an internal supervisor. All the schools that involved external staff stated that clear guidance and protocols needed to be in place for this role.

Of course every external supervisor is like a minor supervisor, the actual project supervisor is actually a member of academic staff. (Programme Director, School D).

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, the interviewed staff indicated that all students were grouped, with 5–6 students per group, so that staff could produce bigger studies more likely to result in publishable work.

[We are] having to give a lot of input and [we will] be able to get bigger, publishable projects (Combined Interview (Programme Director and senior member of staff from Pharmacy Practice), School N).

Staff recognised that group projects were an area of educational debate. There were some concerns that group work might 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 supported the staff needs for RAE publications, (a major academic requirement in the UK, but not elsewhere) but also enhanced the student experience. In view of this, it appeared that

the group project were an area worthy of further consideration.

The expertise of research supervisors was a key issue in relation to project supervision. This was particularly so in pharmacy practice and clinical areas where there is a relative lack of permanent academic staff qualified to PhD level, compounded by significant dependence upon teacher practitioners to supervise projects. The workload problems on core staff were compounded by the limited research experience and capabilities of most teacher practitioners coupled with 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. As predicted in an early review of the LREC process (Jesson & Wilson, 2004), 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. (Programme Director, School D).

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. (Programme Director, School E).

We're trying to think of ones [projects] that don't need it... We're doing lots of projects on students. (Combined Interview (Programme Director and senior member of staff from Pharmacy Practice), School N).

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. (Programme Director, School F).

In spite of the concerns above, staff were positive about the importance of the final year project with nobody seriously questioning its continuation.

Students' interest

Finally, we asked students whether they thought research was important. In general, they were positive. Nearly two-thirds (61%, $n = 573$) considered that the project was either very important or fairly important, whereas only 23% ($n = 215$) considered it to be not very or not at all important. 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.

Discussion

The present study provides a snapshot of pharmacy undergraduate education during 2003/4. Interviews with senior pharmacy staff have confirmed that all the UK schools met the requirements of the Royal Pharmaceutical Society of Great Britain (Royal Pharmaceutical Society of Great Britain, 2002) to include a "significant" final year research project. Although there were considerable variations in the form, length and assessment load associated with the project, in all schools it made a substantial contribution to the final year and a significant contribution to the degree classification. The student survey has elucidated the opinions of students enrolled on MPharm courses and although the absolute response rate of 50.62% is disappointing, it is not surprising in view of the difficulties we experienced in trying to make relationships with schools for the administration of the survey. 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.

A fundamental question is why there should be an explicit requirement for pharmacy undergraduates to undertake a research project. As educationalists, we recognise and support the need to develop the researchers of the future but this aim does not appear sufficient to justify compulsory inclusion of a research project within a largely vocational degree. Criterion five of the RPSGB accreditation document (Royal Pharmaceutical Society of Great Britain, 2002) states that the project must "address a research question or a problem, must involve a critique of the research methodology employed and must include an analysis of results generated directly by the student or indirectly by others as primary researchers". There appears, therefore, to be no requirement for the student to plan the research, to design the research methods or to undertake the research. More fundamentally, the only criterion on graduate competencies that is directly relevant to research (criterion 21) is that the graduate "can apply appropriate research approaches and methods to manage scientific and practice problems." In this context, it is interesting that our study showed much variation in the preparation for the project

in terms of formal training in research methods, arguably more relevant to criterion 21 than the execution of a project without such training.

The 1997 report of the Pharmacy Practice Research and Development task force (Royal Pharmaceutical Society of Great Britain, 1997) first articulated the vision for a research aware pharmacy workforce and there is little doubt of the argument for the need to "foster an evaluative culture within pharmacy." If pharmacists are to engage with the recent changes in government expectations of the profession (Department of Health, 2000, 2003) and so move forward as healthcare practitioners able to develop extended roles such as medicines management, they must be capable and confident to read and assess the research of others. This is research awareness, the lowest of the three levels described in the Pharmacy Practice R&D Report and the level that appears to equate with the criterion five of the current accreditation requirements. More challenging is the need to develop smaller number of undergraduates become the future "research practitioners" and the "research leaders".

As highlighted earlier as a key concern of staff, it is important to note that 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 within Great Britain (Department of Health, 2001, 2005) 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 approaches to minimise these problems such as group projects where students had a common area of research. The project therefore involved collaborative working but the production of an individual final report. It is relevant in this context that there was evidence from the student survey that although many students considered that they had enough choice in the selection of their research project, overall almost a third of respondents considered that they did not have sufficient choice. This may be further evidence of stresses in the capacity of schools to offer a project to all students.

Another serious area of concern within schools was the issue of research capability within the practice and clinical area. The Research Governance Framework places considerable importance upon research capability and for the need that research takes place in a Quality Research Culture. Section 3 of the 2005 framework (Department of Health, 2005) requires that "all those involved in research also have a duty to ensure that they and those they manage are appropriately qualified, both by education and experience, for the role they play in relation to any research". Given the applicability of the framework to student projects,

this requirement must apply to research supervisors. In this context, it was clear that whilst many schools offered practice based projects in conjunction with practising pharmacists, this did not reduce the supervisory load on internal staff. The concerns over supervisory capacity that emerged in this study correlate with data from the 2002 pharmacy workforce census, which indicated that only 5% of registered pharmacists had a PhD, with 10% having a Masters and 15.3% holding a diploma (Hassell & Shann, 2003).

The critical question that arises is as to the educational purpose of the final year project. A positive finding from our study was that nearly two-thirds of pharmacy students considered that the project to be either very important or fairly important. Students clearly engaged with the final year project and feedback from key staff members during the interviews indicated that they perform well. However, it must be remembered that although students indicated general support for the project, this comments is made without any major practice experience and the indication of importance may reflect the contribution of the project to the overall degree classification. Further research could explore the views of recently qualified pharmacists on the usefulness and experience of the final year research project.

In conclusion, this study has highlighted the need to question the purpose of the final year project. The current accreditation requirement is not articulated in terms of any desired educational outcomes. If for the majority of students, the intention is to develop an appreciation and understanding of research methods and to encourage critical thinking then there are well established alternative approaches that would not be inconsistent with the QAA frameworks for Masters level qualifications (Quality Assurance Agency, 2001a,b) which states that such awards can be made after taught programmes, research programmes or a mixture of both. The essential requirement for a Masters qualification is that “students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems”. A full research project is only one approach to this.

For the majority of students, the resource and staff issues of continuing individual projects need to be balanced against the increasing demands for clinical and practice education to meet the vision for future pharmacy services (Department of Health, 2003). This is not to say that there should not be projects. The development of future pharmacy undergraduates to become future research practitioners and leaders is also essential, not least to ensure renewal of the academic pharmacy workforce. Different approaches might well be needed for these students and the research project

would be a key element in their education. However, with the pending introduction of the Section 60 Order under the Health Act 1999 and the consequential review of accreditation requirements, this would be a suitable time to review the future feasibility of a compulsory, large scale, final year student project for all students on the MPharm degree course.

Although this has been a UK study, we would suggest that the findings have a wider relevance. The UK requirement for a substantial project derives from recommendations of an EU advisory group. The development of the European Research Area (Commission of the European Communities, 2002) is leading to uniform policies across the EU in relation to research governance and research ethics and the structures and processes within higher education are being harmonised with the accelerating move towards a European Higher Education Area (Communiqué of the Conference of European Ministers Responsible for Higher Education, 2005).

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