The Use of Work-Based Learning in an Undergraduate Teaching Program

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ABSTRACT. There is a widespread commitment that the teaching of professional subjects should not be limited to the acquisition of esoteric knowledge, but that students should acquire skills and personal abilities that enhance their future professional role. Such skills, abilities, and knowledge may be developed from a program of structured learning in a work placement. This paper outlines the develop-

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ment of structured work-based learning activities for use by U.K. undergraduate pharmacy students in an eight-week standardized summer vacation work placement in community pharmacy. Assessment methods were developed to quantify the learning outcomes and acceptability of the work placement to the students, employers, and university. The whole process has been evaluated to demonstrate benefits. *[Article copies available from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworth.com]*

INTRODUCTION

The teaching of professional subjects in universities, colleges, and other higher education institutions should not be limited to the acquisition by students of esoteric knowledge. The student should develop skills and personal abilities which enhance their performance in a future professional role. Ideally, such skills, personal abilities, and knowledge may be developed from a program of structured learning in a work placement. A predetermined series of work-based learning activities in a standardized work placement, accredited by the academic institution, would present a formalized scheme for the implementation of this ideal. The integration of a structured, assessed program of work-based learning into higher education courses is an attractive educational development, provided there is no overall reduction in the level of specialized knowledge delivered to the student (1).

In reviewing pharmacy in the U.K., The Nuffield Report (2)–a government sponsored enquiry–recommended that the teaching of communication skills and topics relevant to the pharmacists' future professional role be included in the undergraduate course. Another of the recommendations was the "making use of vacation experience gained by students of the environment in which pharmacy is practised." One possible way to implement these recommendations would be the development of structured work-based learning for use in a vacation training program. Work-based learning has been defined as "applied learning in a work environment where a wide range of skills can be acquired" (3). It can vary in form from short placements of a few days to much longer placements of up to a year. However, if work-based learning is to be implemented, then some attempt must be made to develop assessment methods in order to evaluate the outcomes.

This paper describes briefly the overall development and assessment of a series of structured work-based learning activities for use by undergraduate pharmacy students in a community pharmacy work placement. This type of development is unique in the U.K., where the pharmacy degree course is of three years duration. Students attend the university course but are not expected to participate in any pharmacy work activities during their course. After graduation, students must undertake a full-time preregistration training year in a pharmacy placement under the supervision of a pharmacist and successfully complete the preregistration examination (equivalent to licensure examination) before acceptance onto the U.K. Pharmaceutical Register.

AIMS

The aims of the project were to develop:

1. a program of structured work based learning activities to extend the student beyond a simple awareness of the workplace
2. associated teaching material for presentation after the work placement
3. assessment methods to evaluate the usefulness of the work-based learning activities and the suitability of the work placement
4. assessment methods to quantify any changes in the skills, abilities, and knowledge of the students.

METHODS

The work-based learning activities, assessment methods, and teaching materials were designed and produced by a pharmaceutically qualified project team consisting of university academics, employers' representatives, and educationalists. A cohort of 36 students (Group A) were allocated on a voluntary basis to a community pharmacy work placement for an eight-week vacation training program in the summer vacation between the second and

third year of a three-year Bachelor of Science pharmacy course. The remaining cohort of 33 students (Group B) acted as the control group and did not participate in the vacation training program and associated work-based learning activities.

The work-based learning activities were structured to enable each student to undertake the same assignments. Experiential learning without structure would not have been acceptable to the academic institution. The structured work-based learning activities were developed to satisfy the following criteria:

1. relevant to the students' learning needs
2. suitable for the development of professional skills
3. suitable for self-completion by the student
4. agreed to by all parties prior to commencement of the work placement.

The work-based learning activities were defined and presented in a manual containing informational material together with integrated structured and semistructured work assignments* for use by the students during the work placement. The work-based learning activities involved the student in information retrieval skills, manipulative skills, professional skills, knowledge-based skills, and communication skills. For example, structured work assignments required specific information to be (a) retrieved and listed, and/or (b) compared to other information, and/or (c) discussed in terms of professional requirements. Semistructured work assignments required students to describe specific professional tasks which they had undertaken and to recount the outcome(s), such as querying prescriber's intentions on a prescription.

The work-based learning manual contained sections on patient counselling and informational material on the symptoms, etiology, and treatment of a number of minor ailments commonly presented by customers/patients to community pharmacists. The minor ailments were categorized in four topic areas: pain, upper respiratory tract, dermatological, and gastrointestinal tract conditions.

Each student in Group A was allocated an eight-week work

*Copies available from the authors on request.

placement in a chain pharmacy. Standardization of the work placement was ensured by:

1. allocating students individually to pharmacists who acted as work placement tutors
2. issuing each student and work placement tutor with a copy of the work-based learning manual
3. assigning each student to defined task-centered employment areas for specified time periods
4. the academic and employers' representatives of the project team monitoring the activities in the work placement by regular visits and telephone calls.

The work placement tutors provided a professional role model, supervised the students on a day-to-day basis, and encouraged and assisted the students with the work-based learning activities.

University-located tutorial workshops were developed for attendance by all the students (Groups A and B) after Group A had attended the work placement and attempted the work-based learning activities. These tutorials workshops, based upon the four topics outlined in the work-based learning manual, were designed by the project team and delivered by some of the work placement tutors. The aims were to:

1. complement and reinforce the information contained in the work based learning manual (Group A)
2. extend any skills and knowledge gained during the work placement (Group A).

Assessment methods were developed for use prior to, during, and after the work-based learning activities. These assessment methods included: (a) a multiple-choice question examination* designed to test the students' knowledge of community pharmacy practice that was administered to both cohorts of students prior to, and after, any possible participation in the work-based learning activities; (b) structured surveys* designed to assess the acceptability of the work-based learning activities and the work placement, which consisted of semantic differential scales, bi-polar adjectives (4, 5), and

*Copies available from the authors on request.

free response questions administered to students and workplace tutors; (c) semistructured interviews of students and workplace tutors to assess the work-based learning activities and interactions in the work placement; and (d) quantitative assessment of the work assignments.

In addition, all students were assessed after the tutorial workshops for competence and communication skills using a structured objective role play (SOR) approach modified and adapted from the medical model (6). This SOR approach involved:

1. each student being presented with typical problems requiring professional advice and judgment, such as a lay person presenting with symptoms of a minor ailment and asking for advice from a pharmacist
2. a community pharmacist acting the role of a lay person seeking advice
3. each student acting the role of a community pharmacist and obtaining information from, and offering advice to, the lay person.

Methods of assessing the SOR involved completion by the students of a number of questions requiring short answers based upon the information that the student should have elicited from the lay person and by the community pharmacist (who role-played the lay person) of a structured assessment of the questions that should have been asked by the student (see Figures 1 and 2). A defined marking system was used to produce an overall student performance.

RESULTS

The results from the attempts by the students at the multiple-choice question examinations (see Table 1) showed that both groups changed their performance between the first and second attempts, but that Group A increased their performance at the second attempt to a much greater statistically significant extent. These results demonstrate the usefulness of structured work-based learning activities in work placements to increase undergraduate students' knowledge of community pharmacy practice.

FIGURE 1. Example of a student answer sheet (to be attempted by the student after the interaction with the simulated patient). Topic: Acne.

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Department of Pharmacy
STUDENT ANSWER SHEET

Student's name_____

1. How old was the girl with the spots?
2. What relation was she to the enquirer?
3. What was your diagnosis?
4. What medication had already been tried for the spots?
5. What medication has she been prescribed for another condition?
6. What would you recommend for the spots?
7. What is the active ingredient in the preparation you recommended?
8. What other advice did you give the enquirer?

Results from the structured surveys and semistructured interviews have shown that the use and relevance of the work-based learning manual and the associated work assignments (see Tables 2 and 3) were acceptable to both the students and the pharmacist tutors. Similarly, Table 4 shows that the students obtained job satisfaction and value from the work placement. All the students considered that the work placement and work-based learning activities were enjoyable or very enjoyable and 90 percent reported that their confidence in dispensing and pharmacy work had increased during the work placement. Results from the subjective assessment of the students' feelings towards the work placement as demonstrated by the Hoste bipolar adjective procedure (see Figure 3) indicated the acceptability of the work placement; any score greater than 3.5 was positive (maximum possible score is 7.0).

After the students return from the work placement, the work assignments were quantitatively assessed with over 70 percent of students completing them fully. In the opinion of the students the work assignments were useful during the work placement and afterwards in the tutorial workshops. The few students who did not complete fully the work assignments were "not motivated" (free response comment) according to the pharmacy tutors.

FIGURE 2. Example of the questions that should have been asked by the student during the interaction with the simulated patient. Topic: Acne.

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EXAMINER'S SHEET

Simulated patient's initial question.

Can you give me something for my daughter to get rid of her spots?

Student's name _____

Please tick relevant box if student asks any of the following questions.

How old is your daughter?	[ ]
Where are the spots?	[ ]
What type of spots?	[ ]
How long has she had the spots?	[ ]
How often does she shampoo her hair?	[ ]
Does she use make-up?	[ ]
Has anything been tried to get rid of the spots?	[ ]
Is she taking any prescribed medication?	[ ]
Total score	_____

Examiner's comments

TABLE 1. Performance of Students in the Multiple-Choice Question Examination

Student Group	Change in performance between 1st and 2nd attempt (%)	Significant difference
Group A	70.54	at 0.01
Group B	16.83	at 0.01

The SOR approach enabled an assessment of each student's competency in communication, counselling, and OTC prescribing skills (7). The SOR approach was considered to be of value by both students and the participating pharmacists (who acted as the lay person).

TABLE 2. Students' Opinions of the Work-Based Learning Manual and Associated Work Assignments

Value	Students' view (%) $n = 36$	**Relevance**	Students' view (%) $n = 36$	**Usefulness**	Students' view (%) $n = 36$
excellent	11.8	very relevant	23.6	extremely useful	8.6
very good	41.2	relevant	58.8	very useful	62.8
good	38.2	some relevance	17.6	useful	25.7
fair	8.8	little relevance	0.0	little use	2.9
poor	0.0	not relevant	0.0	no use	0.0

TABLE 3. Pharmacist Tutors' Opinions of the Work-Based Learning Manual and Associated Work Assignments

Value	Pharmacists' view (%) $n = 36$	**Relevance** $n = 36$	Pharmacists' view (%) $n = 36$	**Usefulness**	Pharmacists' view (%) $n = 36$
excellent	30.4	very relevant	39.1	extremely useful	13.0
very good	56.6	relevant	56.5	very useful	60.9
good	8.7	some relevance	4.4	useful	21.7
fair	4.3	little relevance	0.0	little use	4.4
poor	0.0	no relevance	0.0	no use	0.0

The overall results from the assessments can be categorized into benefits to all the participants. Benefits obtained by the students are shown in Table 5, the employer in Table 6, and the academic institution in Table 7. Finally, some students considered that participation in the work-based learning activities as part of the vacation training

TABLE 4. Students' Opinions of the Work Placement

Job satisfaction	Students' opinion (%) $n = 36$	Value	Students' opinion (%) $n = 36$
Extremely satisfying	14.3	Excellent	34.3
Very satisfying	54.3	Very good	40.0
Satisfying	26.3	Good	14.3
Little satisfaction	2.8	Little value	11.4
No satisfaction	0.0	No value	0.0

program should become a mandatory part of the undergraduate course in pharmacy.

DISCUSSION

Although accredited work placements (internships) are a well-established component in the undergraduate education of U.S. pharmacists (8,9), the provision of organized work placements for U.K. pharmacy students during their summer vacation is rare. The project described briefly in this paper is novel in the U.K., particularly the development and availability of structured work-based learning activities for use by pharmacy students in standardized work placements. In the project described, a number of unique assessment methods (quantitative and qualitative) have been developed to evaluate the different aspects of the work-based learning activities and the work placement. This is in contrast to the many work experience programs in which only the subjective aspects are evaluated, but not the increase in quantitative knowledge. The structuring of the work-based learning activities and the standardization of the work placement enabled each student to participate in a similar experience and allowed comparative student assessment. Other workers have reported the need for structured work activities (10) and standardized work placements (11).

FIGURE 3. Overall student mean marks for bipolar adjectives used to describe the work placement.

Bipolar adjectives		mean mark
useful	useless	6.5
bad	good	6.0
easy	difficult	4.4
enjoyable	detestable	5.7
fragmented	coherent	5.4
satisfying	disappointing	5.8
confusing	*clear*	5.3
worthless	valuable	6.3
vital	unnecessary	5.4
narrow	wide	5.2
consistent	variable	4.6
optimistic	pessimistic	5.6
false	true	5.7
relevant	irrelevant	6.4
weak	strong	5.4
deep	shallow	5.1
passive	active	5.7
commercial	noncommercial	5.1
small	large	4.7
informative	uninformative	6.1
practical	theoretical	5.5
boring	interesting	5.6
fast	slow	5.0
formal	informal	4.2
imaginative	conventional	4.0
uninspiring	stimulating	5.3
professional	unprofessional	5.9
maximum possible mark:		7.0

TABLE 5. Benefits to the Students

Development of the ability to perform professional tasks
Interactions with role model professionals
Increase in independence, confidence, and self-motivation
Experience of working in teams
Opportunity to communicate with professionals, other working staff, and clients
Career decisions based on work experience

TABLE 6. Benefits to the Employers

Employers developed a positive attitude towards training
Assessment of students for future employment
Development of good relations with academic institutions
Influence and involvement with future developments in the training of professionals

TABLE 7. Benefits to the Academic Institution

Integration of work-based learning into the undergraduate course
Compliance with the training recommendations from the government and other official bodies
Development of assessment methods
Establishment of academic-employer relations

Results from the attempts by the students at the multiple-choice question examination have shown that those students participating in the work-based learning activities increased their knowledge of community pharmacy to a greater (statistically significant) extent than non participants. Such quantitative evidence of knowledge increase after work-based learning is unusual, since most work-based learning projects do not have such defined quantitative outcomes (11). However, there are reports of pre- and post-evaluations of behavioral objectives (12) and students attitudes/perceptions (13) of intern/externships. Indeed, the idea that work-based learning is valid and creditworthy and that it may be possible to assess its value in terms that allow it to be accredited within an academic program is contentious in the U.K. (14). However, quantitative evidence of knowledge increase as a result of work-based learning activities could provide some of the required academic credibility.

After participation in the work-based learning activities, students attended tutorial workshops to reinforce the workplace learning. On completion of the workshops, the students participated in the SOR. The assessment of the SOR was structured to enable a quantitative assessment of the students ability to respond to a lay person's problems/symptoms representative of those encountered in community

pharmacy. This approach has been modified from the medical model to accommodate the needs of pharmacy students. The approach has been successful and assimilated into the teaching of pharmacy practice.

One requirement to achieve a successful outcome of work-based learning must be its acceptability to both the learner (in this case the pharmacy student) and the employer. Without acceptability the program could not achieve its aims. Assessment methods for this project were designed to evaluate the work-based learning activities, including the manual, and the work placement. Results from the assessments have shown that all the different facets of the program were acceptable to the majority of the students and the employers. The recommendation by some of the students that participation in the work-based learning activities should become a mandatory part of the undergraduate course in pharmacy is a very positive outcome, which has been acted upon by the academic institution.

Overall evaluation has shown benefits to the students. One of these benefits was the important role played by work-based learning in helping to shape the students' career decisions. A similar increase in career knowledge has been reported by other pharmacists providing work experience for pharmacy students (13,15).

The benefits to the employers included the ability to assess students for future employment during their work placement. This benefit is extremely valuable to employers and, indeed, has been cited as one objective of employers of interns (16,13). However, it is a benefit that could be exploited by academic institutions when trying to encourage employers to provide work placements for students. Finally, the overall evaluation was acceptable to the academic institution and this has resulted in the work-based learning program being integrated into the undergraduate course.

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