

The Relationships between Approaches to Study in Higher Education and Life-long Learning Attributes in an Undergraduate Pharmacy Cohort

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INTRODUCTION

There is currently great interest in the concept of life-long learning (LLL) with this term being used frequently in science, education, industry and within health care provision. In the UK, the recent National Health Service white paper, "The new NHS – modern and dependable", (Department of Health, 1998) proclaims life-long learning as one of its main tenets. However, LLL is not a new initiative.

The concept of life-long learning stems from adult education (Gestrelus, 1979) which included both formal and informal instruction models, planned and opportunistic learning, to gain knowledge and ability through study practice or instruction. The term has countless definitions in the literature relevant to the particular context and environment in which it has been developed. Ultimately, it is clear that responsib-

ility lies with the individual for life-long learning; individual circumstances will determine specific invocations of the concept. The European Life-long Learning Initiative echoes Hanson and DeMuth (1992), defining it as an active process where the individual deliberately seeks out knowledge, values, skills and understanding, employing it to result in self-actualisation, professionally and personally. This definition can be equated with the perceived ideals of a formalised education, where the pupils are taught about the world, and how to nurture a place for themselves in their society.

Pharmacists, like all professionals, are expected to maintain and enhance their competence throughout their career and are supposed to fulfil their role as life-long learners (Hanson and DeMuth, 1991, 1992). The process of "becoming a pharmacist" for an undergraduate can be described as professional socialisation

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(Smith *et al.*, 1991) which can occur in two settings: the formal education of the pharmacy degree and the actual performance of work of the profession (Pavalko, 1971). These two situations are very different and if, as is evident, there is a pressing need for competence to be maintained but enhanced, not only undergraduates need to be prepared for this new and increased responsibility to society. There are increasing numbers of pharmacists produced every year who all need to be providing a level of service that meets service demand. The introduction of the general practitioner contract in 1990 by the UK government (Kelly and Murray, 1994) has already begun to set minimum standards for other professions; surely it is only a matter of time before this is the case for pharmacy. The following questions arise: how do undergraduate programs reflect this requirement for pharmacists? What are pharmacists' and undergraduates' perceptions of the term life-long learning? Answers to these questions will be pertinent for planners of undergraduate programs to ensure the curricula will facilitate subsequent post-graduate participation in learning.

There is no agreed universal definition of life-long learning but there is tacit acceptance that it is an individual perception. Measuring it becomes difficult when the term itself has innate meaning for any particular individual. However, in order to progress and flourish as a profession, pharmacy must seek out a philosophy of life-long learning and determine how this notion can be nurtured in undergraduates. It is clear that formal education prior to practice is a logical place to instil both values of life-long learning and an appreciation for the continuing need to remain contemporary.

In order to monitor changes in the quality of student learning and to investigate students' learning in higher education, Entwistle and Ramsden (1983) developed the Approaches to Studying Inventory (ASI). This questionnaire had 16 sub scales covering different approaches to study which were in turn grouped under four

main orientations to study (Ramsden and Entwistle, 1981; Entwistle, 1988). These were "meaning orientation", a "reproducing orientation", an "achieving orientation" and a fourth called a "non-academic orientation" which represented various learning styles and pathologies described by Pask (1976). The meaning orientation and reproducing orientations were analogous to Marton's concept of deep and surface level processing, respectively. The achieving orientation was a third approach identified by Ramsden (1979) where an individual displays a strategic approach, with behaviour principally influenced by assessments. Students are motivated by a desire to succeed and use processes that will most likely achieve high grades in examinations. This process is different from the reproducing orientation, as the student will undertake question spotting and attempt to make a good impression on influential teachers (Newble and Hejka, 1991). These students tend to do well in exams but often have incomplete understanding, as their approach has been influenced by course requirements and ego-enhancement. The ASI cannot be used as a single tool since learning behaviour is influenced by environment, teaching method, subject matter and student perceptions of all these factors. Studies have found that learning approach can vary, indicating that students do not necessarily consistently use one approach for differing learning tasks (Ramsden and Entwistle, 1981). This evidence suggests there is an aspect of context involved with learning.

The ASI has been used in various groups of students from different cultural and environmental backgrounds (Ramsden and Entwistle, 1981; Morgan *et al.*, 1982; Clarke, 1986; Harper and Kember, 1989; Kember and Gow, 1990). There has been extensive use of the ASI in medical undergraduate education. In the pharmacy educational context, it has only been used in a sample of hospital pharmacists undertaking a post-registration clinical diploma (Kostrzewski and Dhillon, 1997).

AIMS AND OBJECTIVES

The aim of the study was to investigate the interaction of undergraduate education and subsequent life-long learning attributes within three cohorts of pharmacy undergraduates.

To achieve this aim the following objectives were identified.

1. To identify the learning orientations of the three cohorts during their final year of the undergraduate program.
2. To relate study orientations to life-long learning attributes.

METHOD

Sample Selection

Three cohorts of final year undergraduate students were selected from a single school of pharmacy. The three cohorts were selected based on the type of programme they experienced during their undergraduate period:

1991 entry year cohort: These pharmacists will have been in practice for three years at the time of the study, and are representative of a pre-reform, orthodox pharmacy curriculum.

1994 entry year cohort: During the study period, they were engaged in their pre-registration year and represent the final cohort from the pre-reform curriculum.

1995 entry year cohort: This student cohort were completing their final year at time of the research and represent the first student cohort of a revised curriculum.

As part of in-house evaluation, all students complete the Approaches to Study Inventory (ASI) in their final year at university. The results from the ASI were analysed using SPSS Version 7 and factor analysis was conducted using principal components analysis. The result of this factor analysis was used to purposefully sample for the qualitative arm of the study.

A semi-structured interview schedule was developed and piloted to investigate life-long learning attributes. Face to face interviews were audio-taped and took place either in the interviewees home, workplace or at the university. Interviews were transcribed and coded using QSR NUD*IST 4. Coding validation was conducted using an independent researcher. The coding frame was analysed using display matrices as described by Miles and Huberman (1994).

RESULTS

Approaches to Study Inventory (ASI)

Factor analysis using principal factor analysis resulted in 54% of the total variance explained using the eigenvalue one criterion. A screen plot indicating a four factor solution was available. Following oblique rotation, the resultant structure matrix was examined for these factors. The first two factors were broadly consistent with the two orientations of study identified by Marton and Saljo (1976a,b, 1984). These factors showed internal reliability with coefficient α of 0.66 and 0.52 for the "deep" and "surface" orientations, respectively (Table I). The other two factors were less defined and loaded on a mix of items that

TABLE I Internal reliability of extracted factors

	Item	Item-total correlation	α if item deleted
Factor 1 $\alpha = 0.66$	Q1	0.4224	0.6117
	Q12	0.3641	0.6288
	14	0.4368	0.6189
Standardised item $\alpha = 0.68$	Q9	0.3635	0.6370
	Q13	0.3903	0.6210
	Q10	0.3800	0.6269
	Q7	0.3123	0.6456
Factor 2 $\alpha = 0.52$	Q14	0.2861	0.4709
	Q18	0.2622	0.4840
	Q11	0.3218	0.4474
Standardised item $\alpha = 0.52$	Q2	0.2805	0.4735
	Q8	0.3023	0.4596

was difficult to attribute to a label or orientation. Little difference between proportions of the two factors was noted within the three cohorts and low measure of association existed between the two factors ($r = -.168$, $p = .006$). The factor analysis suggests that the ASI tool may not have full validity in this pharmacy undergraduate sample. The ASI does not seem to be able to distinguish well between a "deep" and "surface" orientation and suggests that both orientations may exist simultaneously in the same student. Alternatively, it may be posited that this tool does not describe the learning orientation entirely for this population. As previously suggested, there may be an element of context, effect of environment and perception of learning outcomes to the learning orientation. These factors may not be adequately described in this tool.

Qualitative Interviews

Seventeen interviews (12 female; 5 male) were conducted. The sample consisted of eight students from the 1995 entry year, six from the 1994 entry year and three from the 1991 entry year. Interview subjects were selected by an independent researcher on the basis of having a high score for Factor 1 (deep approach) or Factor 2 (surface approach). The orientation of study to which each student ascribed was not known to the researcher whilst conducting the interviews. Table II shows the emergent themes that were identified from the coded interview data. These themes were mapped out for each of the interviewed cohort sample, and additionally by Factor 1 and Factor 2 score.

DISCUSSION OF RESULTS

This study has investigated the study approach of pharmacy undergraduates and attempted to relate this to their learning in professional life. It

has been possible to gain an insight into the way undergraduates and graduates approach their learning using qualitative and quantitative methodologies. Three different entry years (1991, 1994, 1995) representing changes in the undergraduate curriculum were selected as the study sample.

By conducting a longitudinal study, it was possible to compare retrospective graduate perceptions of the undergraduate degree, in addition to the perceptions of current undergraduates in their final year. The data obtained from both the quantitative and qualitative arm could be used in a process of triangulation to obtain a wider picture of learning in pharmacy. Whilst it is recognised that the results of this study may not be generalisable, an indication regarding the framework of learning at university and beyond, is apparent.

The poor correlation between the "deep" and "surface" factors in the three cohorts sampled questions the validity of the ASI as a tool to identify such orientations in this particular population. The "deep/surface" dichotomy is apparent in the study sample. However, these approaches may be independent of each other and can occur together in the same student. Learning is a multi-faceted moiety influenced by a variety of factors including: the environment in which learning is undertaken, perception of the environment, teaching methods, students' learning styles and motivations to learn (Entwistle and Tait, 1990). The 1995 entry year cohort were subjected to a more problem-based learning curriculum, yet had similar proportions of approach to learning factors as the other two cohorts. The similarity in learning factors suggests students are able to use multiple approaches at will, depending on the demands placed upon them. While it was not possible to extract a single "strategic" learning orientation from this sample data, the presence in students of both the other orientations may constitute this one factor – the third orientation to study. It may be postulated that there is, in fact, only one

TABLE II Definition of emergent interview themes and codes

Coding theme	Description
Code 1: Passive involvement – <i>passive recipient of information</i>	<ul style="list-style-type: none"> ● Pedagogic – education at university is pedagogic and highly based upon traditional teaching methods ● Lectures – education <i>via</i> lectures to convey knowledge which is accepted by student ● Structured – structured and rigid environment in which to learn with little freedom outside the syllabus ● Theoretical – knowledge given in purely theoretical with little vocational or practical relevance
Code 2: Active involvement – <i>actively involved in learning process</i>	<p>(a) Self directed – environment where learning is taking place encourages student to identify learning objectives</p> <ul style="list-style-type: none"> ● Seeking – finds answers to problems or questions by searching various sources ● Questioning – enquiring about information given to seek out relevance and meaning ● Self-reliance – reliance on individual to seek out appropriate information ● Responsibility – responsibility to yourself and others to ensure learning is appropriate <p>(b) Teaching – effect of lecturers, tutors and others teaching in the work and university environment</p> <ul style="list-style-type: none"> ● Inspiring – ability to inspire learning ● Supportive – provide support and guidance when required ● Feedback – provide feedback on learning to allow a measure of performance ● Relating to students – ability to treat students as adults with valid and interesting arguments
Code 3: Motivation to learn	<p>(a) External motivation – extrinsic factors affecting learning of individuals</p> <ul style="list-style-type: none"> ● Goals – need to meet defined goals as set by individual or others ● Promotion – financial and employment prospects acting as facilitators to learning ● Examinations – to pass an examination will result in defined learning ● Pressures – familial, institutional or personal pressure which may affect learning ● Image – image portrayed to others if learning is not evident ● Competition – competitive atmosphere with others affecting learning in positive and negative ways <p>(b) Internal motivation – intrinsic desire to learn</p> <ul style="list-style-type: none"> ● Standards – internal standards which individual needs to meet ● Interest – interest in subject matter will encourage a desire to learn ● Self-esteem – knowing that learning has achieved a goal for others or for individual ● Personal autonomy – freedom to choose what to learn and when
Code 4: Development from learning	<p>(a) Professional development – learning resulting in continued professional development</p> <ul style="list-style-type: none"> ● Intrinsic – by being a pharmacist, learning is an innate quality and professional development is an automatic process ● Technology – advances in science, technology and medicine necessitate learning in order to remain current ● Credibility – professional respect from colleagues, patients and others will ensure learning ● Continual – learning is a continual process occurring throughout life <p>(b) Personal development – by learning will develop personally</p> <ul style="list-style-type: none"> ● Communication skills – develop interpersonal and communication skills through learning at work and university ● Confidence – learning and acquiring information leads to increased personal confidence to tackle different things ● Empathy – ability to empathise with others as a result of learning through life ● Maturity – process of maturation as learn

factor in this population, the strategic learner, who uses whichever approach is most appropriate for academic achievement.

Ramsden and Entwistle (1981) claim that a surface approach to study is the result of a learning environment subscribing to formal teaching methods, a lack of vocational relevance and an overloaded curriculum. Students in the 1991 and 1994 entry years were subject to a more orthodox degree program, predominantly based on formal teaching methods with students viewed as *passive recipients of information* (Code 1, Table II). Interestingly, this perception was shared by both the "deep" and "surface" approaches to study within these cohorts. From the qualitative data, those with high scores in the "deep" approach report a change from the pre-university learning environment marked by a greater independence in learning at university, whereas those displaying "surface" approaches viewed university as a continuation of the pedagogic environment at school. This variance suggests there is a difference in perception of the same academic environment between students of the same entry year. There was an emphasis on both theoretical and factual knowledge which acted as a stimulus to memorise information, with the intention of reproducing the material for examinations. This is compatible with the findings of Marton and Saljo (1976a,b) where excessively factual material induced a "surface" approach. All students within these cohorts did not find such learning satisfactory and appreciated the inclusion of tutorials and smaller group sessions later in the course where they had improved understanding following such activities. This indicates the students' desire for an *active involvement in the learning process* (Code 2, Table II), and the adoption of a certain method of learning dependent on the way the task presents itself. Moreover, students perceive different outcomes of learning when subjected to alternative teaching methods. Therefore, it may not be possible to categorise learners into "deep" and "surface" learners *per se*, but it may reflect the overall portrait of learning

in the curriculum to which these students were exposed.

Qualitative Data

The 1995 entry year in particular discussed being able to seek out relevant information by adopting a critical stance and questioning information, rather than by simply accepting the stated fact and opinion. In contrast to the earlier cohorts, the 1995 entry year sample found that the curriculum fostered a sense of responsibility in learning and perceived themselves as active participants in the learning process. They tended to utilise technical jargon to describe their learning experiences, for example, describing their education as "self-directed" and "being more independent." The coding patterns from the qualitative interviews also distinguished between "deep" and "surface" study approaches. Those subgroups who were high scorers on "deep" and "surface" approaches placed different emphasis on themes relating to feedback and discussion, with high scorers on "deep" approaches emphasising their desire to have discursive elements as a normal part of their learning. This emphasis was additionally stronger with the 1995 entry cohort, but any further subtleties in attribution should be resisted, bearing in mind that the qualitative data was not obtained in a longitudinal manner (*cf.* quantitative ASI data) but at a single time point, and thus represents past perceptions and attitudes for the 1994 and 1991 entry year cohorts. The influence of passage of time cannot be controlled for in this inter-cohort qualitative analysis.

Further contrasts were evident between high "deep" and "surface" scorers in all cohorts, particularly over the strength of external motivation attributed towards assessments and exams; "surface" approach interviewees tended to express greater extrinsic motivation than high "deep" approach students. Conversely, high "deep" approach scorers expressed

greater tendencies to internal motivational factors, such as inherent subject interest (Code 3, Table II).

The coding approach allowed primary meanings to emerge from the interview data, and care was taken to ensure that a preconceived coding frame was not applied to the data. Overall, the evidence suggested that for these past and present undergraduates, approach to study is a reaction to the environment, the teaching, subject relevance and interest attributed to the learning task by students, and modulated by the students' perceptions of all these influences. Students are able to change the way they approach study depending on what the task requires from them and what they *perceive* it requires from them.

The qualitative evidence also suggests that, to these respondents, life-long learning does not have the same meaning as continued professional development (CPD). The former was usually described in terms of a holistic concept, involving learning about the way the individual fits into society. CPD was more readily identified with professional reactions to advances in science and technology, expectations of the public and colleagues, and the fear of obsolescence. It was of interest to note that only the high "surface" approach scorers of all three cohorts discussed personal maturation as a consequence of their learning experiences. It may be that those undergraduates who tend towards a "deep" approach do not self-reflect on any change in their maturity in their early post graduation years, as they may already have a deeper rooted sense of "maturity" in their learning behaviour. It was also apparent that the most recent 1995 entry year cohort (despite being undergraduates at the time of interview in contrast to the other cohorts) had a greater tendency to emphasise the personal responsibility for continued learning, in whatever definition, following graduation. It is tempting to attribute this to learning habits acquired during their undergraduate period, particularly as this attitude would be expected

to be stronger in individuals who were already in practice.

CONCLUSIONS

In conclusion, it may not be necessary to foster a "deep" approach in a student to ensure that learning is appropriate. Instead a focus needs to be directed towards designing curricula which will encourage critical thinking in an environment conducive to learning. This will facilitate the transition to the work-based environment.

Recommendations for continuing research include the development of a tool to measure approaches to learning in a non-structured, informal and working environment and the investigation of graduates, subject to a problem-based learning curriculum for learning approaches and attributes in the workplace.

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