

The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS)

Glennys Parsell & John Bligh

Objectives Although shared learning activities are gradually being introduced to health care undergraduates, it has not been possible to measure the effects of educational interventions on students' attitudes. The main objective of this study was to develop a rating scale using items based on the desired outcomes of shared learning, to assess the 'readiness' of health care students for shared learning activities.

Design and participants A questionnaire study of 120 undergraduate students in 8 health care professions.

Results Principal components analysis resulted a 3-factor scale with 19 items and having an internal con-

sistency of 0.9. The factors have been initially named 'team-working and collaboration', 'professional identity' and 'professional roles'.

Conclusions The new scale may be used to explore differences in students' perception and attitudes towards multi-professional learning. Further work is necessary to validate the scale amongst a larger population.

Keywords Education, undergraduate, *methods; health personnel, *education; *interprofessional relationships; questionnaires.

Medical Education 1999 33 95–100

Introduction

A strong case has been put forward for all health care students to experience shared learning as part of their preparation for professional practice^{1–3}. The argument is based on the premise that professionals need to be able to 'work' well with both patients and colleagues in a health service that is essentially team-based at the point of delivery. If the needs of patients, families and communities are to be placed at the centre of health care provision, then knowledge, skills and attitudes needed to 'work' (and learn) effectively should be identified and acquired. The debate continues about how students should experience shared learning. There is an assertion that this experience should occur as soon as possible in undergraduate education, although there is little evidence resulting from evaluations of such experiences at this level, from which to draw conclusions^{4,5}. However, those practitioners who have

developed and evaluated interprofessional courses in both primary care and universities have assembled a number of characteristics and conditions needed for shared learning to be effective. It is claimed that difficulties in implementing and developing shared learning are organizational, structural and attitudinal^{6–8}. Whilst accepting that the former two are formidable to overcome, it is the latter, which appears to be the most difficult to change. It is for this reason that the aims and objectives of interprofessional learning are generally accepted as first, to limit or reduce the prejudices which may exist between professionals and second, to reduce ignorance of the roles and duties of other professionals, thereby increasing knowledge and understanding, and third, to improve team-working and collaborative skills^{9–12}. The attention paid to the first two points, through addressing the need to change attitudes, will help to facilitate the development of the third. Elements of adult learning theory^{13,14}, social and psychological theories¹⁵, group and team-functioning^{16,17} and professional knowledge¹⁸ have been considered and included in the design, development and implementation of shared learning initiatives. From these theories and their practical applications, a number of characteristics and conditions needed for positive outcomes for interprofessional learning (and working) have been

Department of Health Care Education, University of Liverpool, Liverpool

Correspondence: Glennys Parsell, Department of Health Care Education, The University of Liverpool, 3rd Floor University Clinical Department, Duncan Building, Liverpool L69 3GA, UK

identified. They can be grouped into four key dimensions as follows:

1. relationships between different professional groups (values and beliefs people hold);
2. collaboration and team-work (knowledge and skills needed);
3. roles and responsibilities (what people actually do);
4. benefits to patients, professional practice and personal growth (what actually happens).

Interprofessional learning must therefore be designed to take these four dimensions into account. The first dimension is concerned with the variation in attitudes between professional groups that needs to be considered when designing shared learning programs. They include, for example, those attitudes concerned with professional identity, prejudice, stereotypical views about each other, and the historical legacy about status and professional knowledge which each group strives to maintain. The second dimension considers the knowledge and skills needed to work interprofessionally and, it is assumed, to learn interprofessionally. This includes several aspects of course design such as content (use of clinical cases, simulated patients, problem scenarios), teaching and learning methods (building on previous experiences, small-group learning, facilitation of learning, teachers as role-models for interprofessional learning), resources (extra accommodation, personnel, documentation, timing) assessment (both formative through feedback, and summative through a final assessment) and evaluation (what, how and for whom). The third dimension considers what people actually need to be able to do in practice, for example, to collaborate and work in teams to provide a holistic approach to managing patient care (contributions of different professionals). Finally, the fourth dimension places emphasis on the outcomes of interprofessional learning, for example, the goals of providing seamless care for patients, achieving greater efficiency through better communication, and increased personal satisfaction deriving from a job well done. It is because of the immense shift in attitudes needed to make interprofessional learning effective, that attitudes of students to shared learning need to be assessed on entry to their courses, after clinical placements and on exit, prior to becoming independent practitioners. Based on these four dimensions an instrument to assess the 'readiness' of students for shared learning has been devised. This paper describes the development and refinement of the instrument using exploratory factor analysis that was carried out to assess the instrument's validity.

Method

The pilot questionnaire

A large pool of items was generated which reflected the concepts within the four dimensions previously identified. This conceptual framework was constructed using evidence from the literature, the views of practitioners and academics, and the authors' personal experience of implementing shared learning initiatives for undergraduate health care students. Individual items in the questionnaire were examined by 13 experts representing different professions who were asked to rate the relevance of each item to the construct being measured. They were also asked to comment on clarity, format and ease of completion and their suggestions were incorporated into the final pilot version. Integer responses ranged between 1 (strongly disagree) and 5 (strongly agree). The questionnaire is entitled '*Multi-professional Shared Learning*'. Brief instructions for completion and a definition of 'shared learning' were included to ensure that respondents understood the concept being measured and that responses were related to the same definition.

The sample

The pilot sample comprised of almost equal numbers of second-year degree students representing eight professions, 120 in all. These were: medicine, dentistry, physiotherapy, nursing, occupational therapy, orthoptics and both therapy and diagnostic radiography. Due to a huge discrepancy between the numbers of students in each academic department, the final composition of the sample included almost the entire year groups of orthoptists and radiographers. To balance these numbers, 15 students from each department of physiotherapy, nursing, and occupational therapy were randomly selected on the basis of their attendance at a time-tabled lecture. Similar numbers of dental and medical students were selected in the same way but were drawn from much larger year groups. Women students constituted 83% of the sample due to the female-dominated courses in nursing and professions allied to medicine. The questionnaires were completed by the pilot group in the same academic week in April 1997, under similar supervised conditions and in an average time of 8 minutes.

Statistical analysis

Principal components analysis of the responses was performed with varimax rotation using the statistical package for the social sciences (SPSS version 6.1.2).

This procedure was used both to reduce a large data-set and to identify clustering items in the scale. Scrutiny of the clustered items enabled hypothetical inferences to be made about relationships between variables. Measures of internal consistency (coefficient alpha α) of subscales and items were obtained using standard psychometric evaluation procedures.

Results

The final version of the scale was developed using well-established stages for confirming the validity and reliability of questionnaires,^{19–21}. This resulted in the staged removal of 26 statements which improved the alpha coefficient (Cronbach's alpha) from 0.59 to 0.81. Nine factors were identified meeting Kaiser's eigenvalue criterion (> 1) e.g. Nunnally²², accounting for 66.8% of the variance in the data. The scree plot suggested the most parsimonious result and three factors denoting 42.4% of the variance were extracted. After varimax rotation, the factor loadings for each item were examined. Items with loadings less than 0.4 and those with loadings over 0.4 which appeared in more than one factor, were discarded. As a result of this process, a further five statements were removed. The final 19-statement three-factor scale achieved an internal consistency (alpha coefficient) of 0.90. The internal consistency measure of each subscale appears in Table 1 as well as the factor loadings for each item.

Description of the principal factors

Subscale 1 – Team-work and collaboration

The items in subscale 1 represent a strong belief that shared learning is beneficial in a number of ways. Six of these items are concerned with the acquisition and effectiveness of team-working skills and three items with the need for positive relationships between professionals and other health care students. They can be clustered into two groups:

Effective team-working. The strongest item in the group is 'Learning with other health care students will help me become a more effective member of a health care team' with a factor loading of 0.79. This is closely followed by 'Patients would ultimately benefit if health care students worked together to solve patient problems' (0.78), 'Shared learning with other health care students will increase my ability to understand clinical problems' (0.77), and 'Communication skills should be learned with other health care students' (0.72). The fifth item making up the subscale is 'Team-working skills are essential for all health care students to learn'

(0.65) followed by 'Shared learning will help me to understand my own limitations' (0.44).

Relationships with other professionals. 'Learning with health care students before qualification would improve relationships after qualification' (0.75), 'Shared learning will help me to think positively about other professionals' (0.68) and 'For small-group learning to work, students need to trust and respect each other' (0.66).

Sub-scale 2 – Professional identity

Seven items contribute to the second subscale which relate to both positive and negative aspects of professional identity. These can be clustered into two groups. Negative professional identity. The subscale is dominated by two items. The first is 'I don't want to waste my time learning with other health care students' (0.78) and 'It is not necessary for undergraduate health care students to learn together' (0.71). The third item is 'Clinical problem-solving skills can only be learned with students from my own department' (0.55).

Positive professional identity. These negatively loaded items are 'Shared learning will help me communicate better with patients and other professionals' (– 0.54), 'I would welcome the opportunity to work on small-group projects with other health care students' (– 0.44), 'Shared learning will help to clarify the nature of patient problems' (– 0.47) and 'Shared learning before qualification will help me become a better team-worker' (– 0.43).

Sub-scale 3 – Roles and responsibilities

Three items make up this subscale. The first is 'The function of nurses and doctors is mainly to provide support for doctors' (0.63), followed by a negatively loaded item 'I'm not sure what my professional role will be' (– 0.52). The last item in the subscale is 'I have to acquire much more knowledge and skill than other health care students' (0.49).

Interpretation of the subscales

Subscale 1 – Team-work and collaboration

This subscale demonstrates a strong link between the positive outcomes of team-working and the adoption of a team-based approach to learning before qualification. Ensuring that patients are the beneficiaries of a holistic approach, is the ultimate goal. The items imply that practitioners need to acquire specific team-working and collaborative skills, be effective communicators and be able to contribute their professional knowledge to a multidisciplinary team^{23,24}. The subscale indicates a willingness and a need to share knowledge and skills

Table 1 Summary of principal components contributing to each subscale

Item	Factor loading		
	I (α 0.88)	II (α 0.63)	III (α 0.32)
Learning with other students will help me become a more effective member of a health care team	0.79		
Patients would ultimately benefit if health care students worked together to solve patient problems	0.78		
Shared learning with other health care students will increase my ability to understand clinical problems	0.77		
Learning with health care students before qualification would improve relationships after qualification	0.75		
Communication skills should be learned with other health care students	0.72		
Shared learning will help me to think positively about other professionals	0.68		
For small group learning to work, students need to trust and respect each other	0.66		
Team-working skills are essential for all health care students to learn	0.65		
Shared learning will help me to understand my own limitations	0.44		
I don't want to waste my time learning with other health care students		0.78	
It is not necessary for undergraduate health care students to learn together		0.71	
Clinical problem-solving skills can only be learned with students from my own department		0.55	
Shared learning with other health care students will help me to communicate better with patients and other professionals		-0.54	
I would welcome the opportunity to work on small-group projects with other health care students		-0.44	
Shared learning will help to clarify the nature of patient problems		-0.43	
Shared learning before qualification will help me become a better team worker		-0.41	
The function of nurses and therapists is mainly to provide support for doctors			0.63
I'm not sure what my professional role will be			-0.52
I have to acquire much more knowledge and skills than other health care students			0.49

with other undergraduates as a way of understanding clinical problems in the workplace. Such learning may also help the development of self-awareness and a greater understanding of the limitations of individual contributions to patient care^{25,26}. The items also indicate the need to cultivate positive relationships between professionals through increased contact before qualification^{27,28} and hints at the need for an educational climate which fosters trust and respect between learners.

Subscale 2 – Professional identity

The items in this subscale reflect the importance attached to the acquisition of professional identities by students as a means of defining their lives, and the power of individual professional cultures²⁹. Academic disciplines can be described as 'tribes' with 'territories'^{30,31} where specific forms of knowledge and language are colonized and students are socialized into their professional roles, including a code of accepted and required practice. The structure and organization of academic disciplines reflects these professional ideologies and is directly at odds with the requirements of

team-based health care. The subscale items suggest that there is an area of conflict between the retention of professional identities through adherence to a discipline-based approach to learning, and a 'readiness' for sharing expertise with other students through team-based approaches to learning.

Subscale 3 – Roles and responsibilities

The items in this subscale suggest that the boundaries which delineate roles in professional practice and the role of academic training in supporting these divisions, are key issues¹. Current professional practice reinforces the idea that some health care roles should be subservient to others, most notably that the doctor is undisputedly the team leader in patient management³². There is, however, a shift towards a belief that the team leader should be dictated by the context in which the team operates and that this may not necessarily be the doctor^{24,33}. In addition, the increasing overlap and blurring of professional boundaries is encouraging both conflict and resolution through debate. The items in the subscale may reflect this redrawing of the professional map.

Discussion

This scale has been developed to measure ‘readiness’ for multi-professional shared learning with a specific population in mind and may not therefore be applicable for use in other contexts. The pilot sample was small, its size being dictated by the numbers of students in the smallest year group, namely diagnostic radiography. To balance the numbers from each profession, equivalent numbers of students were randomly selected by their departments. Although a total sample of 120 is an acceptable minimum for exploratory principal components analysis³⁴ it is acknowledged that a larger sample is likely to give more reliable results. The pilot group represented undergraduate groups from a range of second-year degree courses drawn from the target population. However, the group of medical students may not be a representative sample despite being randomly selected. They represent a very small percentage of the relevant cohort and their individual characteristics are not known. In this respect, making generalizations requires a cautious approach. Although student doctors, dentists, therapists and nurses were included in the study, there are many other professions involved in health care who were not accessible. Further work is needed to include some of these groups.

The three subscales identified account for over one-third of the total variance in the scale and all have strongly weighted items. The internal consistency reliability of the scale is acceptable at 0.9. The strength of the items in the subscales appears to confirm a causal relationship between the latent variable ‘readiness for shared learning’ and some of the attributes needed for team-work and collaboration, roles and responsibilities, professional practice, personal growth, relationships and benefits to patients. As such, the scale has high content validity. Although the scale has been developed using standardized statistical procedures, interpretation is subjective and therefore open to further clarification. At this early stage, however, we believe in the relevance of the instrument, and that it can be used by teachers and students to explore attitudes and perceptions towards shared learning.

Multi-professional shared learning is not easy to implement due to the ways in which prequalification curricula are planned. The provision of learning activities which would help to develop positive attitudes towards team-working and collaboration, is therefore problematic. There is a need to measure the effectiveness of shared learning activities at different times which would provide evidence of changing attitudes. The questionnaire may be a means of providing such

evidence. However, this paper only reports the results of the pilot study. Further work with larger groups of students is in hand to identify reference ranges, and to confirm the scale as an instrument which might record shifts in attitudes. Such evidence may encourage a more willing acceptance of the structural and organizational changes needed for successful implementation.

References

- 1 Areskog NH. The need for multi-professional health education in undergraduate studies. *Med Educ* 1988; 22:251–2.
- 2 World Health Organization. *Learning together to work together for health. Report of a WHO Study on Multi-Professional Education for Health Personnel*. WHO Technical Report Series 769, Geneva: WHO; 1988.
- 3 Funnell P. Exploring the value of interprofessional shared learning. In: *Interprofessional Relations in Health Care*. (ed. by K Soothill, L Mackay & C Webb). London: Edward Arnold; 1995. pp.163–71.
- 4 Zwarenstein M, Atkins J, Barr H, Hammick M, Reeves S, Koppel I, Robb B. Interprofessional education and systematic review: a new initiative in evaluation. Paper presented at the International Conference: Interprofessional Education: Does it Work? The Britannia Adelphi Hotel, Liverpool, 28 November 1997.
- 5 Barr H. Evaluating Interprofessional Education. *CAIPE Bulletin*, no. 10 1995; 10:22.
- 6 Szasz G. Interprofessional education in the health sciences. *Millbank Memorial Fund Quarterly* 1969; 2:449–75.
- 7 Mackay L. Conflicts in Care. In: *Medicine and Nursing*. Chapman & Hall; 1993.
- 8 Carpenter J. Interprofessional education for medical and nursing students: evaluation of a programme. *Med Educ* 1995; 29:265–72.
- 9 Areskog NH. Multi-professional education at the undergraduate level. In: *Interprofessional Relations in Health Care*. (ed. by K Soothill, L McKay & C Webb). London: Edward Arnold; 1994. pp. 125–39.
- 10 Bassoff B. Interdisciplinary education as a facet of health care policy: The impact of attitudinal research. *J Allied Health* 1983; November:280–86
- 11 McMichael P, Gilloran A. *Exchanging views: Courses in Collaboration*. Edinburgh: Moray House College of Education; 1984.
- 12 Jones R. *Working Together – Learning Together*. Occasional Paper no. 33. Exeter, London: Royal College of General Practitioners; 1986.
- 13 Knowles MS. *Self-directed Learning: a Guide for Teachers and Learners*. Follett, Chicago 1975.
- 14 Kolb DA. *Experiential Learning – Experience as the Source of Learning and Development*. Prentice Hall; Englewood Cliffs, NJ, 1984.
- 15 Hewstone M, Carpenter RJ, Franklyn-Stokes A, Routh D. Intergroup contact between professional groups: two evaluation studies. *J Commun Appl Psychol* 1994; 4:347–63.

- 16 Jacques D. *Learning in Groups*. London: Kogan Page; 1991.
- 17 Engel C. A functional anatomy of teamwork. In: *Going Inter-professional: Working Together for Health and Welfare*. (ed. by A Leathard). Routledge; 1994.
- 18 Schön D. *Educating the Reflective Practitioner: Towards a New Design for Teaching and Learning in the Professions*. London: Jossey-Bass; 1984.
- 19 Rust J & Golombok S. *Modern Psychometrics*. Routledge, London. 1989.
- 20 Streiner LD, Norman GR. *Health Measurement Scales – a Practical Guide to Their Development and Use*. Oxford: Oxford University Press; 1995.
- 21 DeVellis RF. *Scale Development – Theory and Applications*. SAGE Publications; London, 1991.
- 22 Nunnally JC. *Psychometric Theory*. 2nd edn. McGraw-Hill; New York, 1978.
- 23 Lowry S. Trends in health care and their effects on medical education. *BMJ* 1993; **306**:255–8.
- 24 Pietroni P. Inter-professional teamwork. In: *Going Inter-professional: Working Together for Health and Welfare*. (ed. by A. Leathard). London: , Routledge; 1994. pp. 77–89.
- 25 Pomeroy VM & Philp I. *Med Teacher* 1994; **16**: 341–346.
- 26 Parsell G, Bligh J. Shared goals, shared learning: Evaluation of a multi-professional course for undergraduate students. *Med Educ* 1998; in press.
- 27 Mackay L. Working and co-operating in hospital practice. *J Interprofessional Care* 1992; **6**:127–31.
- 28 Leiba T. Current developments in interprofessional education. *Br J Nursing* 1993; **2**:631–3.
- 29 Johnson TL. Professionalism: Occupation or Ideology? In: *Education for Professions*. (ed. by S Goodlad). SRHE/NFER/Nelson; Guildford, 1984.
- 30 Becher T. *Academic Tribes and Territories*. SRHE/Open University Press. 19–35 1989.
- 31 Beattie A. War and peace among the health tribes. In: *Inter-professional Relations in Health Care*. (ed. by K Soothill, L Mackay & C Webb). London: Edward Arnold; 1995. pp. 11–26
- 32 Kendrick K. Nurses and doctors: a problem of partnership. In: *Inter-professional Relations in Health Care*. (ed. by K Soothill, L Mackay & C Webb). London: Edward Arnold; 1995. pp. 239–50.
- 33 Reid T. Community nursing practice management and teamwork. *Nursing Times* 1994;December 21/28: **90**, 42–5.
- 34 Oppenheim AN. *Questionnaire Design, Interviewing and Attitude Measurement*. Pinter Publishers; London, 1992.

Received 29 January 1998; revised 22 May 1998; accepted for publication 26 May 1998