Case-based learning in cross-professional groups - the development of a pre-registration interprofessional learning programme

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This is a reprint of an article submitted for consideration in the Journal of Interprofessional Care © (2005) [copyright Taylor & Francis], Volume 19, Issue 5 October 2005, pages 509 - 520

The Journal of Interprofessional Care is available online at:
http://www.informaworld.com/smpp/content~content=a727325298

Abstract

This paper describes the development and evaluation of an interprofessional learning (IPL) programme at the pre-registration level. The principal aim of the study was to investigate whether case-based learning in cross-professional groups is a feasible and an effective way to conduct interprofessional education (IPE). Student volunteers from five different health professional training programmes were allocated to two groups: an intervention group and a control group. Interprofessional attitudes of all students were measured at the beginning and at the end of the study. Group members fed back their views about their learning experience after the 9-week long intervention. The study reports significant effects of the intervention on students' attitudes to different health professions. For example, students in the intervention group tended to view each profession as more 'caring' when compared to the control group. Student feedback was positive, with the main message to integrate the programme in the timetable and to introduce an opportunity for IPE in future years. The initial findings reported in this paper show that this is a feasible and an effective way to deliver IPE across the wide range of professions in the study and that the learning programme was viewed positively by the students who took part.

Keywords: *Interprofessional; pre-registration; case-based; education; health; attitudes*

Introduction

Every year thousands of students enter different health professional training programmes in the UK. Most students arrive with views about their future professional role, and the role of other health care professionals (Carpenter, 1995; Lindqvist, Duncan, Shepstone, Watts, & Pearce, 2005; Tunstall-Pedoe, Rink, & Hilton, 2003). How these preconceptions change or consolidate will depend on the students' learning experiences during their training. The World Health Organisation

(1988) highlighted the importance of developing attitudes that foster good interprofessional working relations. Since then interprofessional education (IPE) has received increasing governmental support in the UK (Department of Health, 2000, 2001, 2002). However, early initiatives in IPE were often short-lived (Barr, 2002) and poorly conceptualised. This led to calls for more research describing methodically planned and evaluated interprofessional training programmes (Barr, 2000; Koppel, Barr, Reeves, Freeth, & Hammick, 2001; McPherson, Headrick, & Moss, 2001; Zwarenstein et al., 1999), in particular at the pre-registration level to ascertain effectiveness of future learning opportunities provided by institutions of higher education. To aid this development Freeth and Reeves (2004) used the 3P model (presage-process-product) described by Biggs (1993) to examine educational approaches aimed at promoting collaborative working. This model is useful to dissect out the components vital for a successful training programme and helps focus attention on what support is needed to obtain the desired outcome. Freeth and Reeves (2004) stressed the importance of being aware that learning opportunities are dynamic systems that constantly aim to reach equilibrium and the need for educationalists to understand how various factors influence all stages of education.

One factor often discussed, is the optimal time to introduce health trainees of different professions to the concept of learning together (Areskog, 1988; Dombeck, 1997; Horder, 1995; Johnson, 2003; Parsell, Spalding, & Bligh, 1998; Pirrie, Hamilton, & Wilson, 1999; Wood, 2001). A scale devised by Parsell and Bligh (1999) to assess students' 'readiness' for interprofessional learning (RIPLS) helps to address this issue. Another equally important factor that influences IPE is the quality of educational facilitation and the ability of facilitators to adapt to the needs of students at different levels of learning. The successful outcome of IPE is dependent upon a large number of aspects including the enthusiasm, determination and patience of the individuals planning and running the learning programme, as discussed by Freeth (2001).

In addition to the differences in opinion regarding the timing of the introduction of IPE, there are different ways of conducting it, for example, providing shared modules for the students with various levels of interaction (Tunstall-Pedoe et al., 2003) or giving students the opportunity to work interprofessionally in a programme or workshop based in a theoretical (Barrett, Greenwood, & Ross, 2003; Parsell et al., 1998) or a clinical setting (Gilbert et al., 2000; Mogensen, Elinder, Widström, & Winbladh, 2002). Which approach to IPE is the best and most suitable may depend on local circumstances. By sharing different experiences of evaluated interventions and identifying key elements vital for a successful outcome, local opportunities may be tailored according to the support available and to the needs of the students. As students are likely to be enthusiastic at the outset of their training, this may provide educational institutions with an opportunity to introduce some form of IPE at an early stage.

Many institutions in the UK are currently trying to introduce IPE opportunities for pre-registration students, with the aim of promoting positive interprofessional attitudes. Some of these involve health care students in their first year. For example, the Faculty of Health and Social Care at the University of West England has shared its experience, whereby health and social care students work together

in cross-professional groups during the first six weeks of their training (Barrett et al., 2003; Johnson, 2003). Another example is the Common Foundation programme at St George's Hospital Medical School with the Joint Faculty of Health Care Sciences of Kingston University in London where students from different health training programmes work together for the first term of their courses (Tunsdall-Pedoe et al., 2003).

The approach to IPE in the Centre for Interprofessional Practice (CIPP) at the University of East Anglia (UEA) is derived from a version of the 'contact hypothesis' discussed by Hewstone and Brown (1986), which advocates that the actual interaction between the students from the different professional groups plays a crucial part in the development of positive interprofessional attitudes. An interprofessional learning (IPL) programme is currently running at the UEA involving first-year students from six different health professions. The students are given the opportunity to develop positive interprofessional attitudes by working together in small cross-professional groups, primarily around a case scenario, and by discussing issues related to interprofessional working. The ultimate long-term goal of the programme is to improve interprofessional team working in clinical practice. It derives from a pilot study that ran during the spring term of 2003 and was developed by CIPP, in close liaison with students and staff in all the different Health Schools at the university. CIPP is independent of any professional group, but works closely with all the different Health Schools and aims to promote interprofessional team working, both at the post- and pre-registration level. At the pre-registration level, CIPP is working towards developing a compulsory IPL programme that includes all health students at UEA and runs throughout their professional training.

This paper describes the pilot study in which the principal aim of investigating whether case-based learning in cross-professional groups is a feasible and an effective way to conduct successful IPE. The pilot involved two groups of students; one group participated in cross-professional groups and the other acted as a control group. The two groups were compared to consider the effect of the intervention on interprofessional attitudes. The paper also reports some of the feedback from the students working together in groups, as this was vital for the development of the current programme.

Method

Ethical approval

This pilot study was approved by the local ethics committee at the University of East Anglia in January 2003.

Recruitment of students

A total of 462 students from five health professional training programmes were approached in the autumn term of 2002. These students were from: medicine (110), nursing (230), occupational therapy (50), physiotherapy (50) and midwifery (22). Each group of health professional students was given a 20-minute presentation outlining the basis of the project, at the end of which they were given

the opportunity to write down their name and contact details if they wished to volunteer to participate in the study. A total of 96 students expressed an interest in joining. These were students from: medicine (27), nursing (21), occupational therapy (23), physiotherapy (19) and midwifery (6). From these 96 volunteers, 46 students were selected to join the intervention; all midwives were included and 10 students were randomly selected from each of the other four health professions. The remaining 50 students were invited to take part in the study as a control group, i.e., they did not participate in the intervention.

Evaluation of interprofessional attitudes

The Attitudes to Health Professionals Questionnaire (AHPQ) was used to assess students' attitudes at the outset of the study and at the end. The questionnaire is still under development and will be further validated after the completion of the IPL programme currently running at UEA. Details regarding the completion of this questionnaire, and a description of its development, are provided in a paper by Lindqvist et al., (2005). In brief, the principal components analysis identified two dimensions that we interpreted as the students' perceptions of the 'caring' and the 'subservient' nature of health professionals. The students were asked to score on individual items to describe each one of the five health professions included in this study. Principal component scores for the 'caring' and the 'subservient' scales are reported here. Data were collected from questionnaires completed by the students participating in the two groups involved in this study, the intervention group and the control group.

Outline of the study

An outline of the study is given in Figure 1. The students in the control group were asked to complete the AHPQ on two occasions, in parallel with the intervention group, at the beginning of the study and at the end.

Intervention

The students were allocated to 10 groups and where possible a group contained five students, one from each of the five health training programmes. A summary of the intervention is given in Figure 2.

Introduction. All students in the intervention group gathered at an introductory session where a presentation was given outlining the intervention (Figure 2) and its main learning objectives (Table I). The format of the AHPQ was explained and the students were made aware that this questionnaire was one of the evaluation tools being used for this study. Informed consent for participation in the study was obtained. Following the signing of the consent form the students were asked to complete the AHPQ before being introduced to each other.

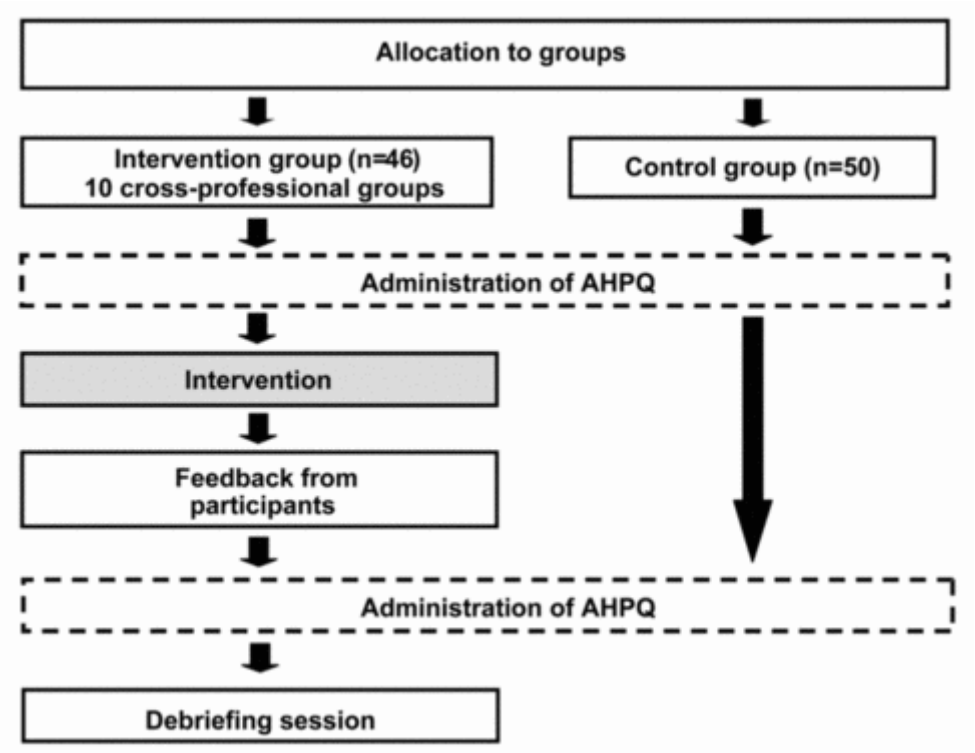

Figure 1. Outline of Study

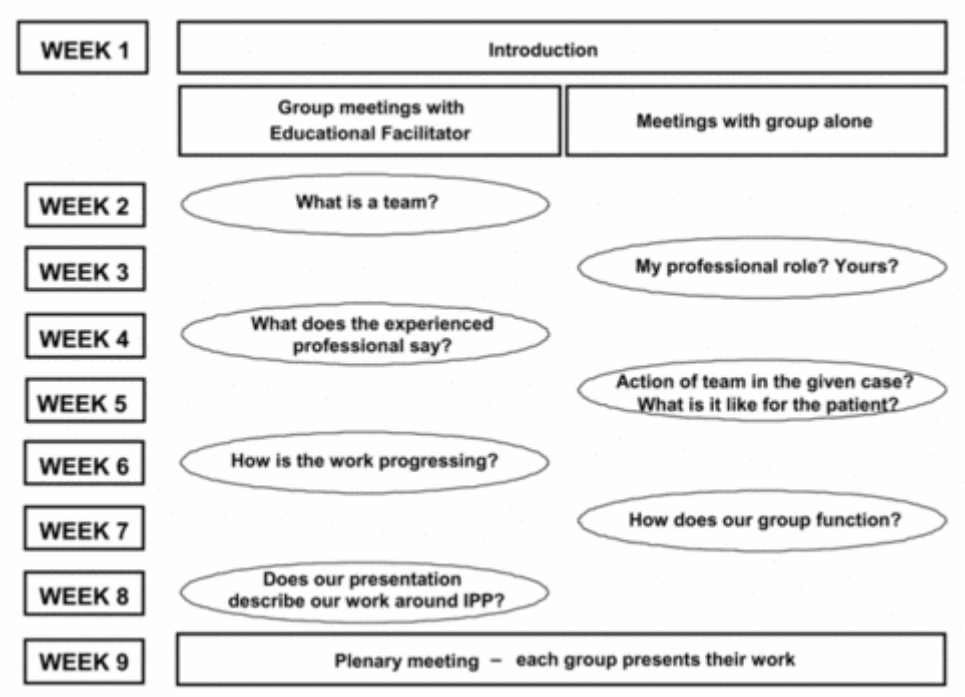

Figure 2. A brief outline of the intervention. The intervention starts with an introduction and ends with a plenary meeting. During weeks 2 - 8 the students meet on their own and with their educational facilitator with the aim of producing a joint report about a case focussing on different questions (some of which are shown in the Figure) and a presentation that reflects on their work.

Table I. The main learning objectives for the students involved in the intervention

The main learning objectives were to:
identify key principles that facilitate successful interprofessional team working;
reflect on why effective interprofessional practice (IPP) is important to patients;
reflect on their own role as health professionals and begin to learn about the role of other health care professions;
begin to understand the benefits of and constraints to good interprofessional team working.

Meetings with the group. Students were asked to meet in their groups once every week for seven weeks to prepare for the final plenary session. They were accompanied by their facilitator at alternate meetings. At each meeting a 'Chair' and a 'Scribe' (which were different every week) were selected by the students and the notes taken from each meeting were circulated to all group members and to the facilitator. At the first meeting the facilitator went through the learning objectives (Table I). The students were encouraged to comment on these and to reflect on the objectives throughout the intervention. The students also discussed their understanding of an interprofessional team. They received the case scenario, which was going to serve as a vehicle throughout the intervention for discussing their respective roles as professionals and issues related to interprofessional team working. The case was developed by staff members in the Centre together with the Deans from the Health Schools included in the study.

During the following meetings the students were asked to produce a joint report describing a management plan for the case, including discussions raised in their group and reflective comments on how they had all worked together. Towards the end of the intervention each group prepared a presentation (20 minutes long) for the final plenary meeting. The students were encouraged to present their work in whatever way the group felt best illustrated what they had learnt about interprofessional team working, thus encouraging their creativity.

Plenary. At the plenary meeting the students presented their work to a panel of experienced members from each professional group. The purpose of this panel was to encourage discussion after each presentation and highlight the good points rather than criticise or evaluate the students' performance.

The meeting was summarised by discussing the many ways in which the students had presented their work, in order to illustrate what they had learnt about interprofessional working. The students were also given the opportunity to air their views about their experience of working in cross-professional groups. At the end of the plenary the students were asked to complete the AHPQ again and to fill in a feedback form.

The feedback forms were analysed by two educational facilitators in CIPP, one of whom was independent of the study. Responses were merged into categories

using content analysis (French, Reynolds, & Swain, 2001) and quantified (Weber, 1994) to gain an insight in how the students wanted the IPL programme to develop.

Debriefing session. The students from the intervention group were invited to join an informal debriefing session one week after the plenary meeting. Students that had worked together in cross-professional groups met, this time in their uni-professional groups, to reflect and share their views on the learning experience with other students in their course and with their facilitator who made notes of their comments. This served as an additional opportunity for the students to have an input in the future development of the IPL programme.

Statistical methods

A repeated measures analysis of variance (ANOVA) was used to compare the AHPQ scores at baseline across the five different health professions (physiotherapy, occupational therapy, nursing, medicine and midwifery) at the outset of the study. Tukey's test was used as a *post hoc* analysis.

A repeated measure ANOVA with Huynh-Feldt adjustment was also used to compare the intervention group with the control group, with respect to the change in each scale, with group as the between-subjects factor and the five professions as within-group factors. The intercept in the model was considered for evidence of a change over time. A multivariate ANOVA (MANOVA) was used to test for an overall difference, considering both scales simultaneously.

Results

There were clear differences in students' attitudes towards the different health professions at the outset of the study. Considering the two groups together, for the 'caring' dimension (Table II) there was strong evidence of a perceived difference between the professions ($F_{3.2,122.3} = 86.7$ $p < 0.001$, repeated measures ANOVA). *Post hoc* analysis, using Tukey's test, indicated that doctors were seen by the students as being significantly less 'caring' than the other four health professions. This was also true for physiotherapists who were thought of as significantly different from the other four professions. There was no significant difference between occupational therapists, midwives and nurses who were viewed as being the most 'caring'.

There was also evidence of a difference in attitudes towards different health professionals with respect to the second 'subservient' scale ($F_{3.9,147.3} = 41.7$ $p < 0.001$, repeated measures ANOVA) (Table III). Again, using Tukey's test in a p*ost hoc* analysis, the students viewed nurses as being significantly more 'subservient' than occupational therapists, midwives, physiotherapists, and doctors (Table III). Doctors were seen as the least 'subservient' and significantly different from the four other professions. Thus, doctors and nurses were at opposite ends of the range for both scales.

Table IV illustrates the changes in the average AHPQ scores over the nine-week study period for the intervention and the control group. Data at the end of the study

were available from 39 of the students in the intervention and 13 students from the control group. The overall change in the 'caring' score was significantly different from zero ($F_{1,50}$ = 2.8 p = 0.018), but not for the 'subservient' score ($F_{1,50}$ = 2.3 p = 0.138). The results suggest that the students in the intervention group tended to view the different health professionals as being more 'caring' and less 'subservient' at the end of the intervention. Although nurses were seen as being slightly less 'caring' at the end of the study, this is likely to be due to 'regression to the mean', as nurses were originally thought of as highly caring and thus towards the 'ceiling' of the AHPQ scale. For both groups there was evidence of a difference across professions with respect to the change in the 'caring' score ($F_{3,150}$ = 6.14 p = 0.001, repeated measures ANOVA), but no evidence of a difference across professions with respect to the 'subservient' score ($F_{3.6,179.4}$ = 0.16 p = 0.945, repeated measures ANOVA).

Table II. Students' views of the 'caring' nature of five health professions at the outset of the study

Intervention Group (n = 46)			Control Group (n = 24)		
Profession	Mean	SD	Profession	Mean	SD
OT	73.07	(6.38)	OT	72.49	(9.01)
Medicine	45.68	(11.31)	Medicine	49.99	(11.48)
Nursing	75.47	(8.95)	Nursing	74.05	(7.04)
PT	63.95	(11.59)	PT	59.52	(10.42)
Midwifery	72.67	(9.34)	Midwifery	70.72	(7.28)

The health professions included in the questionnaire were occupational therapists (OT), medical doctors (Med), nurses (Nur), physiotherapists (PT) and midwives (Mid). Mean ratings and standard deviations (SD) are shown for each profession scored by the students. Note: only 24, of the 50 students invited, agreed to participate in the control group.

Table III. Students' views of the 'subservient' nature of five health professions at the outset of the study

Intervention Group (n = 46)			Control Group (n = 24)		
Profession	Mean	SD	Profession	Mean	SD
OT	6.89	(3.96)	OT	6.80	(3.68)
Medicine	3.26	(2.81)	Medicine	2.23	(3.34)
Nursing	10.61	(4.47)	Nursing	10.85	(3.94)
PT	4.62	(3.14)	PT	4.78	(3.78)
Midwifery	5.41	(3.10)	Midwifery	6.98	(3.43)

Mean ratings and standard deviations (SD) are shown for each profession scored by the students.

Table IV. Changes in students' views of the 'caring' and the 'subservient' nature of five health professions over the nine-week study period.

	Intervention Group (n = 39)			Control Group (n = 13)		
	Profession	Mean change	SD	Profession	Mean change	SD
'Caring'	OT	1.76	(5.37)	OT	- 1.15	(3.71)
	Medicine	7.82	(10.67)	Medicine	2.22	(4.41)
	Nursing	- 0.26	(4.17)	Nursing	- 1.21	(6.70)
	PT	2.28	(5.82)	PT	1.36	(5.29)
	Midwifery	0.53	(4.27)	Midwifery	1.00	(4.41)
'Subservient'	OT	- 1.44	(2.54)	OT	0.58	(2.03)
	Medicine	- 0.36	(2.47)	Medicine	- 0.43	(1.52)
	Nursing	- 0.31	(2.59)	Nursing	- 0.33	(2.86)
	PT	- 0.44	(1.94)	PT	- 0.12	(2.65)
	Midwifery	- 0.14	(2.61)	Midwifery	- 1.06	(2.24)

Mean change scores and standard deviations (SD) are shown for each profession scored by the students. 39 students in the intervention group and 13 students in the control group completed the questionnaire a second time, at the end of the study.

There was little statistical evidence of a systematic difference between the control group and intervention group for the 'caring' dimension at the end of the study ($F_{1,50}$ = 2.8 p = 0.099, repeated measures ANOVA) and no evidence of a difference between the two groups on the 'subservient' dimension ($F_{1,50}$ = 0.24 p = 0.623, repeated measures ANOVA). However, taking the two scales together, there was some evidence of an overall between-group difference ($F_{10,41}$ = 2.36 p = 0.026, MANOVA).

Feedback from students working together in cross-professional groups

39 of the students involved in the intervention returned a completed feedback form. The feedback was very positive, but also included constructive suggestions that highlighted ways in which the intervention could be improved. Quantitative data are presented in Figure 3 as percentages for each of the eight questions on the feedback form, and representative qualitative data are given where possible.

Outcome from the debriefing session

The main purpose of the debriefing session was to ensure that the students had time to reflect on the experience and have a chance to give feedback in a different setting (that is in their uni-professional group). The students were again very positive about having worked with students from other health professional training programmes. They also gave useful suggestions to improve the case scenario by making sure it was realistic and that all students could easily identify their respective roles in the case. The students also emphasised the importance of making this a compulsory programme for first-year students.

Discussion

The initial findings reported in this paper show that this form of IPE is feasible to deliver across the wide range of professions involved in the study and that the intervention was viewed positively by the students who took part. Since these students were volunteers, they are likely to have started out with an interest in interprofessional issues and hence may have been inclined to view the programme more positively than would a random group of students. Nevertheless, the programme was an additional requirement on top of their routine curriculum and thus added to their workload in a way that a compulsory programme would not. Further evaluation of the IPL programme will be needed when the full student cohort are engaged, as there may be mixed levels of motivation.

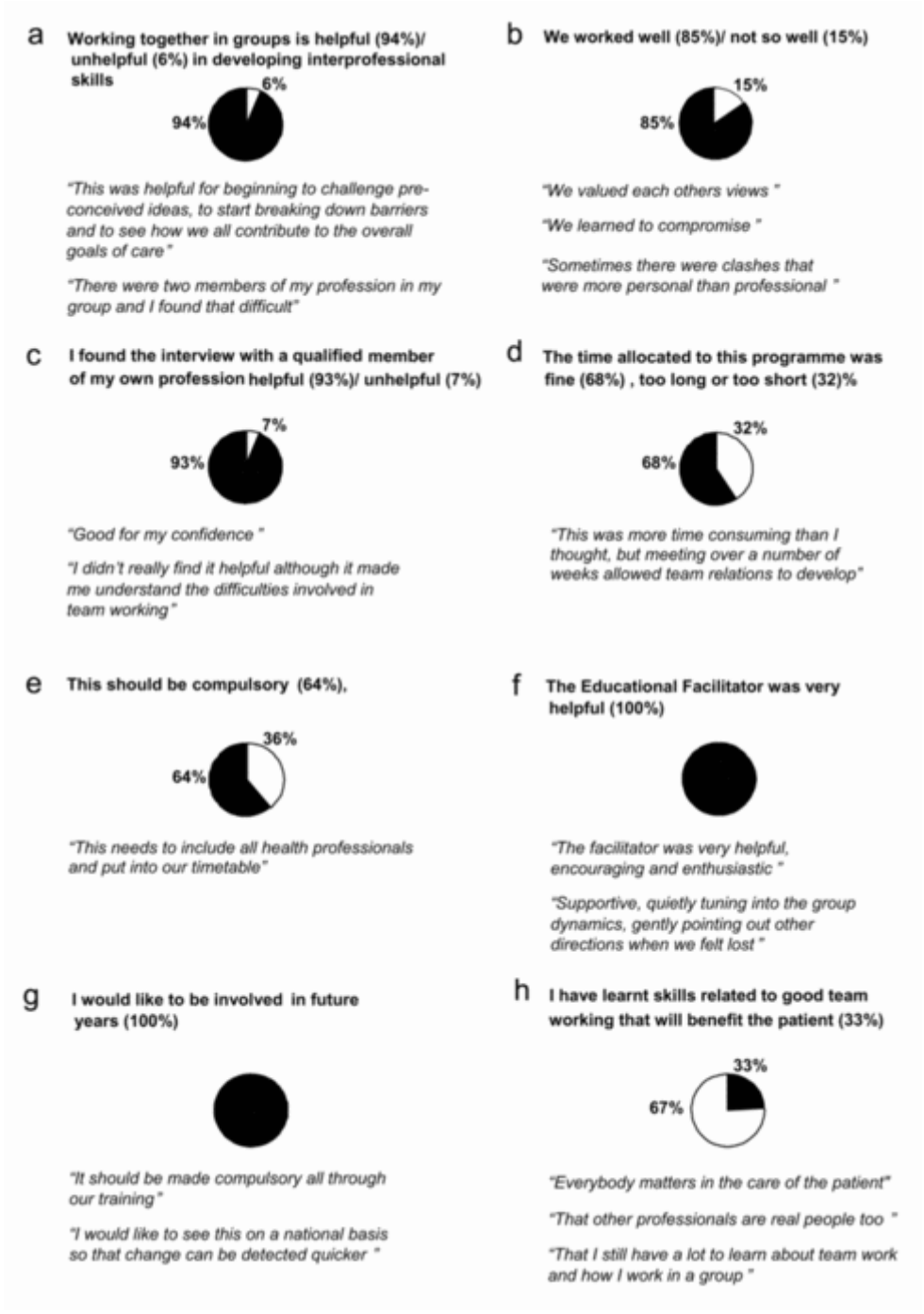

Figure 3. Student feedback from the intervention. The Figure illustrates the feedback from 39 of the 46 students involved in the intervention. Each of the eight questions on the feedback form is represented in a - h. The main themes are extracted and shown as a percentage of the 39 students that completed the feedback form. Representative samples of students' comments are shown.

The pilot study has made it possible to investigate students' attitudes, to their own and other health professions, at an early stage of their training. Attitudes have been assessed both before and after the intervention and at equivalent time points for the control group, in order to look at students' attitudes to the different health professions and thus making it possible to evaluate any changes that might be associated with the experience of participating in the intervention. A number of significant differences have been identified between the student's perceptions of each of the professions on both the 'caring ' and 'subservient' scales of the Attitudes to Health Professions Questionnaire (AHPQ), previously described by Lindqvist et al. (2005). At the outset of the study nurses are seen as the most 'caring' profession by this group of students followed closely by the occupational therapists and midwives. This is in contrast to the students' perceptions of doctors who are seen as the least 'caring' of the health professions under consideration here. Differences are also observed at the outset of training in students' views of each of the profession's 'subservience', as measured by the AHPQ. Doctors are seen as the least 'subservient', and nurses are thought of as the most 'subservient'. These different attitudes at the outset of training are worthy of further investigation and it would be interesting to evaluate the extent to which they have influenced career choices.

The study described here shows some impact of the IPE intervention in influencing a change in attitudes to the different health professions. The repeated measures analysis of variance indicates an effect of time, indicating that overall the students that took part in the study show a change in attitudes during their first year of training. At the end of the study all professional groups are seen as more 'caring' than they were at the outset. This may in part be a maturational effect, or a general effect of their learning programmes. However, it must be noted that although both groups change over time, the pattern of change is different in the two groups, as evidenced by the significant between-group difference from the multivariate analysis of variance. For example, students in the intervention group tended to view each profession as more 'caring' when compared to the control group. Moreover, the direction of change in attitude regarding the 'subservient' nature of occupational therapists is different from that in the control group. Whilst students in the intervention group view occupational therapists as less 'subservient' at the end of the programme, the students in the control group view occupational therapists as more 'subservient'. In other words, both the amplitude and the direction of change is different suggesting an effect of the intervention. This positive change in attitude, as a consequence of the programme, is to a degree in conflict with some existing studies, for example one reported by Tunstall-Pedoe et al. (2003). Further studies will be required to determine the reliability of these findings and address the question as to whether there are particular components of IPE that are likely to lead to attitude change and how we should maximise the beneficial effects of those interventions that do show positive effects.

It is too early to make strong claims for the specific effects of this programme. As mentioned before, the voluntary nature of the subjects and the inability to match perfectly the intervention and control groups in terms of numbers of each profession means these initial findings should not be generalised to other groups or settings. However, it is felt that the AHPQ results combined with the positive qualitative feedback received from the students make it worthwhile extending the

intervention to offer an IPL programme to the full student cohort. Future studies will evaluate this IPL programme, which we aim to make compulsory for all students in the health care programmes at UEA. Consideration will also be given to how the IPL programme could be extended in a developmental way for the subsequent years of the students' health care training.

Acknowledgements

The authors would like to thank all first-year health students that volunteered to take part in this study and to all staff at University of East Anglia, Norwich, UK, who were all very supportive of this initiative.

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