Investigating the factors influencing professional identity of first year health and social care students

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Abstract

Interprofessional education (IPE) involves students from different professions being brought together to learn about each other's profession. Several models of IPE exist, and central to the debate around which of these models is the most appropriate, is the question of the stage of training in which to implement these programmes. Currently, however, there is no consensus on this question. Debate so far has revolved around the strength of professional identities, or lack thereof, amongst pre-qualifying students and how this may influence interprofessional learning. The potential role of professional identity in IPE seems to be unresolved. This paper adds to this debate by investigating:

- the level of professional identity when students commence their professional studies;

- the differences in the level of professional identity between students from a range of professions and

- the factors which may affect initial levels of professional identification.

Data were collected by questionnaire from the first year cohort of Health and Social Care (H&SC) students embarking on IPE as an embedded part of an undergraduate pre-qualifying programme. A sample of 1254 students was achieved. Professional identity was measured using a scale adapted from Brown *et al* (1986).

Our findings suggest that a degree of professional identity is evident before students begin their training. Differences in strength of initial professional identity were observed across professions, with physiotherapy students displaying the highest levels of professional identification.

To test for associations between professional identity and a number of independent variables, an Ordinary Least Squares (OLS) regression model was estimated. The variables which were found to be significant predictors of baseline professional identity were: gender, profession, previous work experience in H&SC environments, understanding of team working, knowledge of profession and cognitive flexibility. Some explanations for these findings are presented and the implications discussed.

Keywords: Professional Identity; Interprofessional Education; Health and Social Care.

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INTRODUCTION

One consequence of modernisation in health and social care services is a move towards multiprofessional team-working (Miller *et al.* 2001). Effective team-working between professionals improves client care (Miller *et al.* 2001; Borrill *et al.* 2001). For effective team-working, traditional professional demarcations need to be challenged and collaborative working explored. This requires that professionals be more flexible, developing a greater understanding of each other (Humphris & Hean, 2004).

In the context of Health and Social Care (H&SC), the ability of staff to collaborate and interact effectively with one another can have a direct impact on patient care e.g., the public inquiry into cardiac surgery at Bristol Royal Infirmary (Department of Health, 2001a), and the death of Victoria Climbié (Department of Health 2003), both identified the need for radical reform of the education and training of professionals and the need to promote patient/ client focused collaborative working, (Humphris & Hean 2004, p.25). In a bid to improve multiprofessional team-working, the Department of Health in England, (DoH) has committed to implementing interprofessional education (IPE) in all pre-registration health care programmes across Higher Education Institutions nationally (Department of Health 2001b). Central to DoH policy is that pre-qualifying students[i] "*learn with, from and about one another to facilitate collaborative practice*" (Barr 2000b, p.3). This is normally implemented through cross institutional collaboration, whereby students in a range of different H&SC professional groups are brought together in small

group activities (e.g., Barrett *et al.* 2003; Barnes *et al.* 2000; Carpenter & Hewstone 1996). This provides a context in which professional groups can come together, interact, and in which complex identities may evolve and structure interprofessional relations. Social Identity Theory is, therefore, clearly a useful framework for understanding the development of professional identity.

Social Identity Theory posits that attitudes/ behaviours of members of one group towards another are governed by the strength and relevance of the members' social identity (e.g., Tajfel and Turner 2001; Haslam *et al.* 2000; Turner 1999). Professional identity, as one form of social identity, concerns group interactions in the workplace and relates to how people compare and differentiate themselves from other professional groups. Professional identity develops over time, and involves gaining insight into professional practices and the development of the talents and the values of the profession (Schein 1978). It can be described as the attitudes, values, knowledge, beliefs and skills that are shared with others within a professional group and relate to the professional role being undertaken by the individual, and thus, is a matter of the subjective self-conceptualisation associated with the work role adopted (McGowen & Hart 1990; Hall 1987; Watts 1987).

Groups of all sorts form the structure of society, and at any one time, an individual may belong to different groups defined along ethnic, national and professional lines. Whilst several identities may coexist simultaneously in an individual, one may be more salient than another at any one time, depending on the context (Turner 1999). Further, whilst an individual may belong to many groups, it is often the professional group that is the most significant in an individual's life. For example, in the context of medical education;

"*…learning to be a physician becomes a very important part of one's self concept and a bolster to one's self-esteem. Our society permits subordinating all other relevant roles to the professional identity. The higher the status of the profession, the more this process of subordinating all other relevant roles will be allowed.*" (Cohen 1981, p.177).

Although this specifically refers to medical education, one could still speculate that students in an interprofessional learning group are likely to be judged on their professional identity, more than, say, nationality, ethnicity or gender, because of the importance of professional identity generally, and its particular salience within the IPE context.

The notion of professional identity has entered the IPE debate at a conceptual level, but has, to our knowledge, been investigated empirically only rarely in the H&SC arena, (Carpenter *et al.* 2003; Hind *et al.*, 2003; Barnes *et al* 2000; Carpenter 1995). Carpenter (1995) for example, found that nursing students in their final year of training did not show very strong professional identity. Doctors on the other hand showed very strong identification at this same stage. A strong professional identity in early health care students was also reported by Hind *et al.* (2003). Barnes *et al.* (2000) dealing with post registration professions undergoing an IPE course, found the professional identities of a range of H&SC professionals to be quite strong, with no professional differences observed at the onset of the programme. However, small decreases in professional identification over the programme were observed in some groups more than others.

If the evidence base around IPE is to usefully progress, it is critical that a deeper understanding of professional identity and its influences be developed. There are two

areas in particular that need to be addressed to further our understanding of professional identity in IPE. The first concerns the stage of education when IPE should be introduced, as there is no consensus on the appropriate time for an IPE intervention and delivery. Some propose interventions as early as the first year of training to inhibit the formation of negative attitudes by new students of each other's professions (Carpenter 1995). Others, however, propose that it should be introduced later in training, perhaps even at a postgraduate level, when professional identities of students are presumed to be sufficiently developed to warrant some form of intervention (Hall & Weaver 2001; Parsell & Bligh 1998). However, there is little to suggest that professional identity is not well developed early in a students' programme, and the authors, do not provide firm evidence in support of either position. The second area relates to the role of professional identity in IPE and how levels of this identity may mediate interactions between professional groups (refer Hean & Dickinson, 2005), and therefore it is appropriate to first look at the salience of professional identity when H&SC students commence their professional education.

Professional Socialisation: Factors that may influence professional identity

It has been of interest to authors such as Melia (1987) to look at professional socialisation of students and novice professionals. Of interest to this paper, however, is how students acquire the levels of professional identity, even before their training has begun.

"*Professional socialization is the complex process by which a person acquires the knowledge, skills, and sense of occupational identity that are characteristic of a member*

of that profession. It involves the internalization of the values and norms of the group into the person's own behaviour and self-conception". (Jacox 1973; Cohen 1981).

The professional socialisation of an individual comes about through critical experiences where procedures and rules experienced by students or novice professionals trigger the construction of a professional identity. However, it is also recognised that there may be differences between the idealised version of the profession, as portrayed *to* novice professionals, and the real work practised *by* the existing members of the profession, (Melia 1987). Therefore, part of the socialisation is about individuals developing an understanding of what it actually means to be a professional (Cohen 1981) and hence, moving beyond the idealised version presented to them. It involves them recognising their own new identity as a member of the profession and "*...the non-deliberate projection of themselves in its terms*" (Du Toit 1995, p.164). This suggests that the process is, to an extent, dependent on the existence of role models to help the novice find the appropriate identity. The role models exert influence on the cognitive stages of professional socialisation, allowing for the development of professional identity. Role models may appear in the work place itself in the form of other professionals, or indeed may be professionals who teach the students as part of their pre-registration programme of study. To this end, it is possible that a student who has received relevant work experience or has an understanding of working with others in teams may have developed a higher level of professional identity than someone who has not had such experience. Mentors/ teachers or family members may also fulfil this role. The knowledge derived of the profession from whichever role model the student has contact with, as well as the

student's own experiences, is central to professional socialisation and identity development. (Jacox 1973; Cohen 1981).

The development of a strong professional identity may also be fostered by other factors such as levels of cognitive flexibility, which refers to an individual's ability to structure knowledge in response to changing situational demands, making it pertinent when considering how a student develops from a novice into an expert, through knowledge construction. (Martin & Anderson 1998). "*Cognitive flexibility refers to a person's (a) awareness that in any given situation there are options and alternatives available, (b) willingness to be flexible and adapt to the situation, and (c) self-efficacy or belief that one has the ability to be flexible"*. (Martin & Anderson 1998, p.3). Communicators who are cognitively flexible are shown to also be assertive and responsive, and it is said that the responsive individual "…*would be adaptable to the relational needs of others in a situation*". (Martin & Anderson 1998, p.4).

Professional identity is important to understanding IPE. This paper contributes to this process by investigating the following research questions:

- What is the strength of professional identity held by first year H&SC students as they enter training?
- Does the level of baseline professional identity vary by profession?
- Which factors are the best predictors of variation in baseline professional identity?

METHOD

Data reported here were collected as part of a longitudinal research project evaluating the impact of an IPE embedded pre-qualifying programme running across two universities in the South of England.

The data were collected by questionnaire administered to the full student cohort of around 1430[ii] first year (pre-registration) H&SC students. Ten professions were represented: Audiology, Medicine, Midwifery, Nursing, Occupational therapy, Pharmacy, Physiotherapy, Podiatry, Radiography and Social work.

This data was collected, by questionnaire, in the autumn of 2003 by the New Generation Project (NGP). The instrument development, piloting, and administration were dealt with by the project team, together with ethics, consenting procedures and data input. The detail relating to the development, piloting and analysis of the data collected are reported elsewhere; see Macleod et al, (2005).

The nursing and midwifery students were combined during the regression analysis because the midwifery sample size was too small to reliably detect differences from other professional groups. Rerunning the analysis and dropping the midwife group produced substantively the same results[iii], although descriptive analysis suggests midwives might have a somewhat higher level of professional identity upon entry than nurses. A final dataset comprised of 1254 student cases, which represented 88% of the students who started courses at that time. Only students who had provided written consent were included in the study.

ANALYSIS

Main study variables

The dependent variable in our models, professional identity, was measured using a scale adapted from that created by Brown *et al.* (1986) to measure group identification. The group identification scale was adapted to suit the H&SC student population through validation using a panel of judges and a pilot of the questionnaire with a similar student sample (Macleod et al, 2005). An Exploratory Factor Analysis (EFA) was conducted on the pool of items to assess whether they formed a uni-dimensional scale. EFA can be used to uncover the underlying dimensionality of a set of variables (Field 2000). In this case it was used to investigate the theoretical constructs that might be represented by the set of professional identity items in the questionnaire. The number of components retained was determined using the following criterion: a Cattell's Scree test (Cattell 1966), which was used to determine where the plot of eigenvalues levelled off. Applying this criterion resulted in a one factor model, implying that the underlying structure of the items was uni-dimensional[iv]. It should be noted that positive and negative factor scores do not represent positive and negative professional identity, the factor scores simply represent a range of values, where the higher scores indicate a stronger professional identity and lower scores a weaker professional identity. This is because factor scores are standardised variables and, as such, have a mean of zero and unit variance. Factor scores, rather than summated scales were used because summated scales apply equal weight to all items, whereas factor scores allow items to reflect their importance in determining individual location on the underlying latent variable, as indicated by the pattern of factor loadings. That is to say, factor scores allow different items to contribute differently to the

overall score, thereby correcting for random errors in the measurement of the underlying concept (Bollen 1989). The EFA was performed using a Principle Components Analysis with varimax rotation. This produced a one component 9-item solution with an internal reliability of 0.79 (Cronbach's Alpha)[v]. The analysis allowed for the development of a professional identity scale, which was then used as a dependent variable in further analysis. A table of factor loadings is provided in the appendix.

Independent variables with potential to explain variation in baseline professional identiy were selected on the basis of theory and extant empirical research. These were, in addition to the demographic variables of age, gender and profession:

Team Understanding Scale

The Team Understanding Scale (Rentsch 1993) measured the students' understanding of team working. The same instrument development procedures as conducted for the professional identity scale were employed to test the reliability of this scale in the H&SC student population. The EFA was undertaken using the same method as detailed for the professional identity scale. The resulting scale had an acceptable internal Cronbach's Alpha coefficient of 0.81. Factor scores were produced to represent the overall scale score. A table of factor loadings is provided in the appendix.

Cognitive Flexibility Scale

The cognitive flexibility items employed by Martin & Rubin (1995) were used to measure an individual's ability to structure knowledge. The EFA was undertaken using

the same method as detailed for the professional identity scale. The resulting scale had an acceptable internal reliability of 0.76 (Cronbach's Alpha). Factor scores were used to derive the overall scale score. A table of factor loadings is provided in the appendix.

Self-reported Knowledge.

The self-reported-knowledge question was a single Likert scale item (ranging from 1 (Low Knowledge) to 5 (High Knowledge)) that asked respondents to give a rating of their knowledge of their own profession (adapted from Carpenter and Hewstone 1996).

Prior Team working experience, Prior Work experience and Family

Respondents were asked to state whether they had prior experience of team working, of working in H&SC, and whether or not they had family member(s) working in H&SC (the responses to items were dichotomous, i.e. yes / no).

Ordinary Least Squares Regression

To test for associations between professional identity and the independent variables set out above, an Ordinary Least Squares (OLS) regression model was estimated using SPSS 11.5. A blocked (hierarchical) entry method was used, where the predictors were added into the model in 'blocks' in order of their hypothesised importance and causal order (their importance towards predicting the outcome). In total, sixteen independent variables were used to predict professional identity in four general categories, as follows:

Model 1 included the *demographic variables* only (gender and age). In Model 2, dummy variables (with social work as the reference category), representing each of the *professions,* were added. In Model 3 the four *experience* variables were added: (work experience, team experience, the number of family members in H&SC and the team understanding scale). In Model 4, the *knowledge/ flexibility* variables were also included: self-reported knowledge and cognitive flexibility. Table 3 shows the results of each model in turn.

RESULTS

The number and proportion of students in each professional group can be observed in Table 1. The students' age varied (range between 18yrs to 57yrs), but, as expected, this was skewed towards the lower student ages (Mean= 25.2 years, Median age=21.0 years, Semi-interquartile range[vi] = 4.5 years). With regard to educational background, 15.9% of students had already undertaken a degree, diploma or professional course. 82% percent of students were female.

Table 1: Number of students in each professional group HERE

The mean professional identity score for each profession is shown in Table 2, and Table 3 presents the results of the regression models.

Table 2: Means scores of Professional Identity Scale for each profession group HERE

The models in Table 3 show the degree to which each independent variable is related to baseline professional identity, controlling for the other independent variables in the model.

The direction and strength of the relationship between professional identity and the dependent variables can be identified by examining the sign, significance and size of the regression beta coefficients (β). Model diagnostics[vii] were checked and found to be within acceptable levels. All four models had a significant F-ratio at the 95% confidence level.

Table 3: OLS Regression Model Predicting Student Professional Identity HERE

As stated, the first block of variables was designed to measure the impact of demographic variables (gender and age) on professional identity, and it can be seen that this model resulted in a positive association between the dependent and independent variables included, which accounted for 0.7% of the variance. (F for Model 1 = 4.141, p=0.016). Of the two variables in the first block, only gender was significant (at the <0.05 level).

Next, Model 2 incorporated the independent variables in Model 1, but added in the dummy professional variables, which accounted for an additional 3.5% of the variance in

professional identity. (F for Model 2 =4.929, $p<0.001$). In this model, being a member of a range of the different professions was shown to be significant.

Model 3 included the independent variables in Models 1 & 2 and added in the work, team (experience and understanding) and family variables, which accounted for an additional 5.2% of the variance in professional identity. Of the variables added in, work experience was significant at the 5% level, and team understanding was significant at the 1% level, and both were positively associated with professional identity. (F for Model 3 =8.277; $p<0.001$). Age, the number of family members and the dichotomous team experience variable were not found to contribute significantly to the model.

Lastly, Model 4 included all the independent variables in Models 1, 2 & 3 and added in the self-reported knowledge and cognitive flexibility variables. These accounted for a further 2.2% of the variance and were both significant at the <0.001 level, and showed a positive association with professional identity. (F for Model 4 =9.110, $p<0.001$).

It can therefore be seen from Model 4 that initial strength of professional identify varied significantly across occupational groups. The effect of the professional group membership is strongest in physiotherapy followed by occupational therapy. Further, positive relationships between student professional identity and work experience, an understanding of team working, the self-reported knowledge of one's own profession together with cognitive flexibility were also calculated.

DISCUSSION

The results of this study show that first year H&SC students already have relatively strong professional identities upon entry to their respective programme of study. The strength of professional identification however, varies by profession. The strongest professional identities were found in physiotherapy students, while social work students had the weakest professional identities of the professional groups considered[viii].

Further, the modelling exercise shows that professional identity in neophyte, pre-qualifying H&SC students, embarking on their programme, is highest amongst those students with greater cognitive flexibility (a greater ability to structure knowledge), previous work experience in H&SC environments, better understanding of team working and a greater knowledge of their own profession. This latter finding must be treated with some caution, however, as the knowledge measure is based on a self-report rather than an external measure of knowledge.

Amongst the demographic variables, age and the number of family members in H&SC and previous team experience of various types did not influence variation in professional identity. Gender, however, was a significant predictor of baseline professional identity. It would appear that sex stereotypes, together with masculine/ feminine traits and designations have implications with regard to intergroup relations, and hence to the way in which professional identity is acted out. It is also reported that gender is an important determinant of the frequency and nature of interprofessional interactions (Kendrick 1995) and has been shown to be activated in the course of social perception (Brewer 1988). This suggests that men and women not only display different levels of professional identity, but that they may also experience it qualitatively differently too.

Results have shown specifically that physiotherapy students display the strongest baseline professional identity. Further, being a physiotherapist is a significant predictor variable in the model that was achieved in this investigation (the strongest of the professional dummy variables). This suggests that there is something about the nature of new physiotherapy students, other than the characteristics controlled for in this study that explains their apparent strength of identity. It could be speculated that, in agreement with findings elsewhere (Du Toit 1998), the impact of being a physiotherapist upon professional identity is related to the differences in selection procedures across the different professional schools. Physiotherapy is a degree that is particularly over-subscribed: 20:1 (University of Southampton 2004). Therefore, students who demonstrate a particular affinity or identification with the profession are likely to be accepted to the course rather than those with lower levels of identification. This speculation would need to be considered in future investigations aimed at exploring other factors associated with the professional identities of new H&SC students.

Self-reported knowledge also proved significant to the model of professional identity developed here. Cohen (1981) suggests that professional identity is acquired through processes of professional socialisation concerned with the acquisition of the knowledge and skills of the relevant professional. Results of the current study, that showed self-reported knowledge of one's own profession to contribute to the variation in professional identity, were, therefore, expected. They may be explained in terms of the fact that students with a better knowledge of their own chosen profession are more likely to identify with their professional group than those who know less.

The scale representing the level of understanding of team working that students report is another relevant factor in the model of professional identity. This may link to the emphasis in university professional prospectuses on team working skills and the likely need for students to demonstrate this for selection. It could be speculated, that students with better understandings of team working could identify better with their profession. However, unexpectedly, the dichotomous variable used in analysis, which dealt with the reporting of actual team experience, did not contribute to the model. This brings into question, whether the understanding of team experience can come about without actually having experienced working in a team, i.e. can students gain an understanding of team working from elsewhere, or that the dichotomous variable is a less reliable measure of this variable.

Cognitive flexibility was also an anticipated variable of influence. Cognitive Flexibility Theory addresses issues of advanced knowledge acquisition. It is defined as "*the ability to adaptively re-assemble diverse elements of knowledge to fit the particular needs of a given understanding or problem-solving situation*" (Spiro & Jehng 1990, p.169). It was hypothesised that greater cognitive flexibility might mean new students were better able to adopt a role (or professional identity) more readily. The relevance of this variable to the model appears to support this.

It was envisaged that work experience in H&SC would be a significant predictor within the model and of professional identity and this was found to be true. Students who have gained some experience in a relevant environment prior to the commencement of their programme will have had interactions with H&SC professionals, possibly staff from the

profession they wish to join. It seems reasonable that interactions and experiences of the environment could help lead to a development of a professional identity. If being socialised into a profession can indeed lead to the development of a professional identity, through the individual developing an understanding of what it actually means to be a professional (Cohen 1981). It is then possible that such an understanding could, at least, begin to develop through work experience in H&SC, where exposure provides a view of the profession not before experienced.

Our results confirm the findings of other investigations reported elsewhere. Hind *et al.* (2003), who also investigated students at an early level of training, and reported similar high levels of professional identity to those reported in the current investigation. Although they do not report whether differences between groups were significant, there were indications that in their study physiotherapists have also shown the highest professional identity.

Carpenter (1995), also finds professional differences in professional identity, reporting that nursing students undertaking a programme of IPE did not show very strong professional identity. Medical students, on the other hand, showed very strong identification at this same stage. The results presented here agree with Carpenter, although it should be noted that the students in this study were entering training, rather than finishing.

Barnes *et al* (2000) dealing with post-registration professionals undergoing an IPE course, finds the professional identities of a range of H&SC professionals to be fairly strong, as would be expected of qualified professionals. However, no differences

between these qualified professionals were observed in terms of their levels of professional identification at the beginning of the IPE programme. If these findings are compared with the current study, differences are likely, once again, to be attributable to the different stage of training and socialisation of the two student groups. It may be suggested from these findings that any differences observed at the beginning of training (in the current study), may be anticipated to have levelled out by the time they graduate (Barnes *et al.* 2000).

Du Toit (1998), considering first year nursing students, investigated factors associated with the processes of professional socialisation of the values and personality traits of the nursing profession. Although this differs from the professional identity scale in the current study, the scales are related. She found a positive relationship between older nursing students and their reports of professional socialisation. However, the current study shows age not to be a factor. This discrepancy may be due to the current study having a wider range of professions and a much larger sample size. Du Toit (1998) does stress, however, that the relationship between age and socialisation was not a strong one. She also, as in the current study, found that family did not appear to influence the early student's socialisation, parental occupation not being found to be relevant in analysis. Lastly, Du Toit (1998) felt that professional socialisation was so strong that it overrode biographical differences between students. However, in this study, gender was found to be significant, which suggests that some biographical differences may indeed be important, at least in terms of professional identity, even if not in the case of professional socialisation.

Limitations exist, in terms of the comparatively low R squared of the model, which suggests that there may be important determinants of the strength of professional identity in addition to those included in this model. However, it would be unwise to place too much emphasis on this indicator of model fit as it may be more a function of the measurement properties of the variables in the model than the strength of the underlying relationships (King 1986).

It appears from the analysis that social work students have a lower level of professional identity than other groups in the study, and physiotherapy students a higher level of professional identity, and it would therefore be appropriate to give further consideration to why this might be so, by testing the differences in coefficients between the different professional groups, (the current analysis only allowed for comparisons to be made to the reference category of social worker).

The study points to the need to investigate other, perhaps less obvious, determinants of the strength of professional identity. For example: differences may exist based on social class and ethnicity of the student, or the potentially rich source of information provided to students by the media. Future investigation of this type of data, using qualitative methodologies, could provide insight into how perceptions of professional identity are formed early on, perhaps even from childhood, and certainly before a student enters university.

There are also limitations to the study that may relate to the measurement of professional identity itself. Students on entry to their programme of study are likely to be highly motivated having just chosen a new career. It may be suggested that they are, therefore,

highly likely to answer positively on a scale asking how they relate to their profession, even if only for self presentational purposes. Additionally, their remains a question concerning whether or not some of the results seen in this study are an artefact of the data collection. This refers to the fact that the questionnaires were administered during an event held primarily to bring all of the different H&SC students from the cohort together and introduce them to IPE. It is possible that the positive and supportive atmosphere created by this event had an effect on the answers that the students gave in their questionnaire, which resulted in students displaying a stronger identification with their intended profession than would normally be the case.

The findings of this study have several implications. Firstly, concern has been shown that IPE may not be suitable when administered at the pre-qualifying stage, due to the potential for professional identity to be underdeveloped at this stage. The current results demonstrated that students report strong professional identity at a very early stage of training. This suggests that fears of initiating IPE too early, based on this premise at least, are unfounded. However there is a clear need to investigate this issue further.

Secondly, the professional differences observed in this cohort may have implications for how different professionals will experience and perform in IPE. Hind *et al.* (2003), for example, showed that the strength of professional identity was related to scales measuring a willingness of H&SC students to engage in interprofessional learning. Furthermore, Miller (2004) found a weak relationship between professional identity and two dimensions of collaboration. An awareness of differences in professional identity

should assist IPE curriculum developers to reflect on how IPE curricula may take into account such differences.

It should be noted, however, that there is evidence to suggest that a particular professional identity does not always translate into expected behaviours, and different individuals may act out the same professional roles quite differently. Jenkins (1996) sums this up by stating that:

> *"It is possible for individuals to share the same nominal identity, and for that to mean very different things to them in practice, to have different consequences for their lives, for them to 'do' it differently"* (Jenkins 1996, p.24).

CONCLUSIONS

The study has raised a number of questions, which are worthy of further consideration. Firstly, it has shown that H&SC students do exhibit a level of professional identity as they enter their programmes of study. Therefore, the process by which professional identity has formed, and continues to develop is of interest. The work of Niemi (1997) on the professional identity of medical students, reported that identity development did not appear to proceed in a linear way. Research is therefore needed to explore the development of professional identity, as students progress through their programmes of study, enter practice and begin their careers, to investigate how this professional identity may impact on practice and ultimately on patient care.

Secondly, there is clearly a need to undertake further research to explore the potential relationship between strength of professional identity and the impact of IPE on student attitudes and beliefs, and the need to map any changes in professional identity over the duration of the programme, and then on into practice.

Lastly, it remains to be seen whether professional identity changes over the course of the professional programme in which IPE is emphasised, and whether the change itself is more pronounced than in students who have not been exposed to IPE. Also, it is important to examine whether certain professional groups change more than others and to understand why this might be.

The data reported in this paper was extracted from the baseline data from a longitudinal survey following two cohorts of students (a comparison and experimental cohort) through their undergraduate programme. Analysis of data gathered at different stages during the longitudinal study will inform the debate further and facilitate exploration of the many questions that remain.

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LIST OF TABLES:

Table 1: Number of students in each professional group

Course	n (% of sample)
Medicine	177 (14)
Midwifery	13 (1)
Nursing (all branches)	599 (48)
Occupational Therapy	73 (6)
Pharmacy	130 (10)
Physiotherapy	75 (6)
Podiatry	38 (3)
Radiography (Diagnostic and Therapeutic)	63 (5)
Social Work	58 (5)
Audiology	28 (2)
Total	1254 (100)

Table 2: Mean factor scores and standard deviations of Professional Identity Scale for each professional group

Course	Mean value	SD
Medicine	0.012	1.096
Midwifery	0.384	0.886
Nursing (all branches)	-0.002	0.962
Occupational Therapy	0.145	0.875
Pharmacy	-0.148	1.137
Physiotherapy	0.582	0.656
Podiatry	-0.189	1.150
Radiography (Diagnostic and Therapeutic)	-0.164	0.814
Social Work	-0.324	1.086
Audiology	-0.222	1.007

Table 3: OLS Regression Model Predicting Student Professional Identity

Variables in Model	Model 1 β	Model 2 β	Model 3 β	Model 4 β
Constant	-0.200 *(0.118)*	-0.655* *(0.200)*	-0.747** *(0.206)*	-1.279** *(0.257)*
Demographics:				
Gender (Female)	0.220* *(0.078)*	0.216* *(0.080)*	0.219* *(0.079)*	0.198* *(0.079)*
Age	0.002 *(0.004)*	0.005 *(0.004)*	0.003 *(0.004)*	0.004 *(0.004)*
Profession:				
Medic	-	0.408* *(0.164)*	0.379* *(0.160)*	0.350* *(0.158)*
Nurse / Midwife	-	0.350* *(0.147)*	0.370* *(0.143)*	0.413* *(0.142)*
Occupational therapist	-	0.535* *(0.186)*	0.496* *(0.181)*	0.462* *(0.179)*
Pharmacist	-	0.292 *(0.171)*	0.351* *(0.167)*	0.353* *(0.165)*
Physiotherapist	-	1.007** *(0.186)*	0.943** *(0.182)*	0.882** *(0.181)*
Podiatrist	-	0.144 *(0.215)*	0.203 *(0.210)*	0.181 *(0.209)*
Radiographer	-	0.237 *(0.195)*	0.426* *(0.192)*	0.417* *(0.191)*
Audiologist	-	0.300 *(0.257)*	0.348 *(0.252)*	0.297 *(0.249)*
Reference category – Social Worker				
Team, Work, Family:				
Team Experience	-	-	0.009 *(0.089)*	0.000 *(0.088)*
Work Experience	-	-	0.148* *(0.064)*	0.138* *(0.064)*
Family	-	-	0.003 *(0.058)*	0.031 *(0.057)*
Team Scale	-	-	0.212** *(0.030)*	0.161** *(0.032)*
Knowledge/flexibility:				
Self reported Knowledge	-	-	-	0.112** *(0.031)*
Cognitive Flexibility	-	-	-	0.120** *(0.035)*
R^2	**0.007**	**0.042**	**0.094**	**0.116**
R^2 Change	**0.007**	**0.035**	**0.052**	**0.022**
F-Statistic (change in F)	**4.141***	**5.096****	**15.984****	**13.628****
df1	**2**	**8**	**4**	**2**

Key: $^{*}p < 0.05$ $^{**}p < 0.001$ Note: Standard errors are shown in parentheses. N = 1126 (some cases were dropped due to missing data on the items).

APPENDIX

Professional Identity Scale	**Factor Loadings**
I feel like I am a member of this profession	468
I feel I have strong ties with members of this profession.	.466
I am often ashamed to admit that I am studying for this profession.	.673
I find myself making excuses for belonging to this profession.	.705
I try to hide that I am studying to be part of this profession.	.734
I am pleased to belong to this profession.	.732
I can identify positively with members of this profession.	.634
Being a member of this profession is important to me.	.610

Team Scale

I am/have been an active member of some form of team.	.645
I enjoy working in a team.	.607
I have observed many other teams of which I am not a member.	.550
My participation on a team has facilitated how the team members work together.	.690
I know how to make teams more effective.	.725
I frequently interact with (i.e. work with, train) teams of which I am not a member.	.535
I understand how people should work together as a team.	.667
I contribute to the teams of which I am a member.	.706
I understand why some teams are ineffective.	.555
I contribute more than my fair share to the teams of which I am a member.	.504

Cognitive Flexibility Scale

When working/learning together with other people in a team, I find it difficult to communicate my ideas effectively	.764
When working/learning together with other people in a team, I avoid unusual situations	.689
When working/learning together with other people in a team, I never get to make decisions	.705
When working/learning together with other people in a team, I seldom seem to have choices when deciding how to behave	.567
When working/learning together with other people in a team, I have difficulty using my knowledge on a given topic in real life situations	.620
When working/learning together with other people in a team, I do not feel sufficiently confident to try different ways of behaving	.707

Note: The items used a Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). The items were coded to the same direction for the factor model to aid interpretation.

Notes

[i] References to 'students' made within this paper refer to pre-qualifying undergraduate students, unless otherwise stated.

[ii] This number was estimated at the beginning of the 2003/2004 academic year and included students that may have withdrawn before the programme began. The response rate for the different occupational groups was uniformly high, and ranged from 82-96%.

[iii] Please contact the corresponding author for details of the analysis.

[iv] The analysis was run on all 12 items, and this yielded a 3 component solution. Examination of the output revealed two items with low communalities (<0.45) and loadings less than 0.5, these items were both dropped and the analysis rerun. The Scree plot was checked and further discussion indicated that a method artefact may exist, (there was a split between positively and negatively worded items and then a third component that only contained two items). The scree plot seemed to suggest that there was one component solution, and this was therefore run. The one component solution was re-examined and all items had loadings above 0.45, except for one which had a very low loading of 0.25 and so this item was dropped and the analysis rerun. All of the 9 items in the final one component solution were checked and had loadings above 0.45.

[v] The internal reliability of the scale was checked using Cronbach's Alpha, where a value exceeding 0.7 is thought to be adequate, (Nunnally, 1978). For further discussion relating to the interpretation of Cronbach's Alpha, refer to Field (2005).

[vi] The semi-interquartile range is one half of the difference between the 75th percentile and the 25th percentile.

[vii] The assumptions of regression were checked. Eg: casewise diagnostics, multicollinearity diagnostics (including VIF and Tolerance), check for outliers and the model fit, along with the assumptions of the regression model (normality, linearity, homoscedasticity and heteroscedasticity) - these were found to be acceptable.

[viii] It should be noted that the figures for statistical significance given for each coefficient relate only to the difference in the coefficient between that particular group and the reference group.