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TESTING THEORY IN INTERPROFESSIONAL EDUCATION: SOCIAL CAPITAL AS A CASE STUDY

ABSTRACT

Theory is essential to understand our interprofessional educational (IPE) practice. As a discipline, IPE has moved from being widely atheoretical to having a plethora of theory imported from the psycho-social disciplines that have utility to understand, articulate and improve IPE practice and evaluation. This paper proposes that when taking this deductive approach to theoretical development in IPE, a greater focus must now be placed on the rigorous testing of these theories within the IPE context. It synthesises two approaches to achieving this, using social capital theory as a case study, and focuses on the first two stages of this synthesis: namely the identification of the concepts and propositions that make up a theory within the study context and second, the value based judgments made by the researcher and other stakeholders on the utility of these propositions. The interprofessional student group is chosen as a possible exemplar of a social network and theory derived concepts and propositions are identified and classified within this context. With a focus on physical network characteristics, validation of these propositions with a sample of IPE educationalists is described. We present a range of propositions specifically related to the size and mix of IPE student groups, the frequency and level with which students participate in these as well as some of the existing evidence that have explored these propositions to date. Refined propositions and the way forward in the future application and empirical testing of social capital theory in IPE is presented.

Key words: social capital theory testing theory, interprofessional education, student groups

INTRODUCTION

A theoretical base is essential to articulate, develop and evaluate interprofessional education (IPE) (Hean et al., 2009). This may be generated from inductive or deductive empirical research. We focus on the latter in this paper. In the last decade the discipline was accused of being atheoretical (Freeth, Hammick, Koppel, Reeves & Barr, 2002). This no longer pertains as a plethora of theories have been imported into the field (e.g. Colyer, Helme & Jones, 2006). Despite this richness, there remains a lack of effective application of these theories in curricula, educational practice and evaluation (Craddock, O'Halloran, McPherson, Hean & Hammick (In Press)).

To address this gap, the discipline must continue to identify IPE relevant theory, but then act to actively validate these theories within this context. This paper opens discussion on how this may be achieved, detailing two approaches to the rigorous validation of theory in practice (Fawcett & Downs, 1992; Wallis 2008). It uses social capital theory to illustrate **part** of this process in the IPE context, specifically the creation and validation of propositions from a chosen theory. The empirical testing of these hypotheses is not addressed here but we conclude with recommendations on how this may be continued in future projects.

Approaches to validation of theory

Fawcett & Downs (1992) present criteria through which theory and its validity may be analysed and evaluated. We focus on two of these criteria here (shaded in grey; Table 1): first, the identification/classification of the concepts and propositions that make up a theory within the study context; second, the value based judgements made by the researcher and other stakeholders on the utility of these propositions. The empirical testing of these propositions, as a final stage of the validation procedure, is a subject for future papers.

TABLE 1 ABOUT HERE

This framework created by Fawcett & Downs (1992) complements the validation framework adapted from the concept of the three worlds of the universe developed by Karl Popper (Wallis, 2008). For Popper, World One (W1) are the facts or reality being observed-the physical world. World Two (W2) are our perceptions/emotions as we observe W1. World Three (W3) is the product/syntheses of these ideas and observations, of which a theory, such as social capital, is an example. These worlds interrelate simultaneously in a reciprocal manner (Wallis, 2008). Wallis adapts these ideas to present a framework for validating theory where the “*validity of theory may be understood within and between worlds.*” This is illustrated in Table 2 in a cross tabulation of world versus degree of validity. This means that validity of a theory can be achieved through three processes (W1, 2 and 3) and be achieved to various levels (levels 1, 2 or 3). In W1, validation of theory means that the theory is tested against empirical evidence collected from the context of study. Data is collected on the physical world and hypotheses are

tested empirically. We are not concerned with this level of validity in this paper, seeing this as the ultimate goal of our endeavour.

In W2, validation means that the theory is tested in terms of how stakeholders perceive its utility and their perceived "*rightness*" of the relationships the theory proposes.

Methodologically, this can be compared with validating a questionnaire (Oppenheim, 1992).

When validating a questionnaire first steps involve presenting the instrument to a panel of judges and asking them to comment on the content and construct validity of the instrument.

This may be achieved through focus groups, or more accurately described as panels of judges.

These panels are not about collecting data but are expected to comment on the construct and content validity of a set of propositions derived from the theory. These groups are not testing the propositions but are in fact validating the propositions that will be tested later in W3. i.e. panellists are not asked to respond to the propositions but instead are asked whether the researchers have presented the right propositions in the first place.

In W3, the theory, as a synthesis of ideas, is evaluated in terms of the complexity of the concepts and propositions it outlines. Although propositions are presented in the paper, we focus on their substantive content and not their structure and therefore World 3 is also not the subject of this paper.

TABLE 2 ABOUT HERE

The two approaches presented in Table 1 and 2 are frameworks of practical utility for researchers, evaluators and curriculum developers who wish to rigorously test the validity of theory that they feel to be right (W2, level 1) as a tool to describe and explain processes and outcomes in IPE. To illustrate the potential of these frameworks, this paper reports the preliminary steps in the validation of social capital theory in the IPE context, specifically as it applies to the social relations that occur within the interprofessional student groups (IPSG), a popular pedagogic tool used in delivering IPE (O'Halloran, Hean, Humphris & Mcleod, 2006). We present only the processes shaded in grey in Tables 1 and 2: specifically the identification of the concepts and propositions that can be derived from this theory and the processes required to determine the credibility or W2 (level 2) validity of these propositions in the eyes of a group of IPE educationalists. We acknowledge that the discussion recorded by this group on the validity of the propositions presented is a subjective judgement, and that a different panel may have reached alternative judgements dependent on their composition. Being representatives of the UK IPE community however, offers them some credibility on the judgements they were making.

Why social capital theory?

Hean, Craddock & Hammick (2012) and Dennick (2012) suggest that theories that describe and explain social interactions are particularly useful in IPE as social interactions are the essence of these socially mediated experiential learning experiences: students learn with, from and about each other. Each professional group brings to the IPSG knowledge resources about the role and

character of their profession. Two central tenets are that the quality of social relationships within the networks must be sufficient for these resources to be shared effectively and learning should be interprofessional. These assumptions imply that the IPSP offers a learning advantage that cannot be accessed elsewhere or through other networks. This is an accumulative advantage as participation in interprofessional groups help students engage in collaborative networks in their future practice. This emphasis on social relationships, and the sustained advantages of working and learning within a group, is in keeping with social capital theory. This motivated us to query the utility and validity of this theory and to explore the nature/consequences of the social relationships formed within the IPSP. Whilst this may make sense to members of the IPE community of practice (Table 2: W2 level 2), evidence to support these propositions is largely absent. Testing of the propositions we develop and validate below will provide this evidence in the future (Table 2 W1, levels 1-3).

Social capital theory has descriptive and explanatory power. It explains social inequalities between individuals/groups as dependent on their access to social networks and the accumulative advantages this affords. However, a test of a good quality theory is its potential to be broken down into falsifiable propositions (Popper, 2002). However, social capital is difficult to measure, limiting its empirical adequacy (Table 1). To address this, the theory must be broken down into its component concepts from which falsifiable hypotheses are more easily generated and understood (Hean, Cowley, Forbes & Griffiths, 2003). This may not always be possible with grander theories such as Marxist theory, for example. Such overarching theories of human behaviour are notoriously difficult to disprove as precise concepts and propositions

are difficult to pin down. The validation of theory of mid range and micro theories such as social capital theory is more feasible, a process part of which is illustrated in the sections below. Here the concepts and propositions of the theory are first unpicked (stage 1, and 2) and later validated and reformulated with a panel of judges (stage 3).

STEP 1: THE IDENTIFICATION AND CLASSIFICATION OF CONCEPTS

The analysis and validation of a theory involves the identification and classification of the concepts and propositions that constitute the theory (Fawcett & Downs, 1992). In analyzing social capital theory, the social network is a central concept. Thus we focus here on IPE interventions in which small group work is the key component of curriculum delivery although we recognise that there are many other means of delivering IPE. The social capital that is generated within these groups is variable as, whilst some student groups are successful in their social learning and knowledge exchange, others are not.

Social capital is the summation of a number of underlying and variable concepts. A concept analysis of social capital (Hean, Cowley, Forbes & Griffiths, 2004) identified key component concepts. These may be applied to the context of the IPSG as follows:

- Network characteristics (e.g. frequency of participation, cohesion amongst members the IPSG)
- External resources within the network (e.g. professional knowledge, team working skills of IPSG members)
- Internal resources of network members (e.g. self efficacy of student members)

- Trust (e.g. interpersonal trust between IPSG members and the formation of generalised trust that the student may transfer to all teams in which they work with in the future)
- Norms and rules that govern the functioning of the IPSG (e.g. assessment guidelines, ground rules set by the students themselves).

Some of these concepts are directly observable and hence measurable, such as the frequency of participation in the IPSG. Other concepts are reliant on self reported measures (e.g. level of cohesion or trust among network members). For a more comprehensive discussion of these concepts of social capital applied to the IPSG see Hean et al. (2012).

STEP 2: THE IDENTIFICATION AND CLASSIFICATION OF PROPOSITIONS

A second step in validating the application of social capital theory to the IPE context, is to identify and classify the range of **propositions** that derive from the theory. The most basic of these asserts the existence of a phenomenon (Fawcett & Downs, 1992) and is typified by the statements:

- Social capital is created within the IPSG.
- Bonding and bridging social capital is generated within the IPSG (bridging capital is generated through interprofessional relationships between students and bonding capital is generated via students' uniprofessional relationships-Looman & Lindeke, 2005).

Some propositions simply propose the definition of a concept. In the IPE context, and using social capital theory, definitional propositions are:

- Students gain social advantages from being part of an IPSG.
- The social advantages gained are the direct, facilitated exchange of knowledge; understanding of each other's professions; and building sustainable relationships with other professionals that transfer into the workplace.
- Advantages can only be accrued within the social and interprofessional environment of the IPSG.

Relational propositions relate two or more concepts. The *social* of social capital suggests the relational proposition that:

- Social capital created in the IPSG group is dictated by the quality of relationships between student members.

The capital side of social capital suggests it to be a dynamic and durable phenomenon: '*an unceasing effort of sociability, a continuous series of exchanges in which recognition is endlessly affirmed and reaffirmed*' (Bourdieu, 1997, pp.51-2). Individuals invest and reinvest in social networks and social capital accumulates through this process. This leads to the existence proposition that:

- Social capital created in the IPSG group is reinvested in future interprofessional teams.

The capital of social capital means that power differentials and social inequality are key and this leads to definitional and relational propositions such as:

- Students enter the IPSG with pre-existing differences in human and social capital
- These differences in apriori human/social capital influence students' learning experiences within the IPSG.
- The key components of social capital (e.g. network characteristics, levels of trust) dictate the social capital generated in the IPSG. It is the optimal combination of these dimensions that delivers the most effective IPE.

Some of the above propositions remain at a level of abstraction that make their operational definition, measurement and testing difficult. In this paper, the authors take the dimension of the physical characteristics of the IPSG network as one of the more tangible dimensions of social capital, and use this to demonstrate how more detailed relational propositions maybe created. We use this to test the validity of the concept (or W2 level 2 validity) with a sample of IPE educationalists. A focus on the physical characteristics is a useful dimension to illustrate theory validation as characteristics and structure of the IPSG are well known practical challenges within the design of IPE curricula. This lends practical as well as theoretical significance (Table 1) to these propositions.

Propositions related to the “network characteristics” components

Social networks range from the informal (e.g., family networks) to the formal (e.g., sports clubs, farming associations). An IPSP is an example of a formal social network created and legitimized through the IPE curriculum. The features of the network mediate the advantage obtainable from it and are categorised as *physical* e.g. network size; heterogeneity, horizontality (Tijhuis, Flap, Foets & Groenewegen 1995) or *affective* characteristics e.g., social cohesion (Kawachi & Berkman, 2000). Behavioural measures of frequency and level of participation in the network are also influential (Putnam, 1995; Veenstra, 2000). These network characteristics describe the nature of the IPSP group and predict how these networks can be optimized to maximize their social advantage. Focusing on the behavioural and physical characteristics of the network, as an example, leads to the relational propositions (RP) detailed in Table 3.

STEP 3: OBTAINING THE WORLD TWO VIEW

In W2, validation means that the theory is tested in terms of how stakeholders perceive its utility and their perceived “*rightness*” of the relationships the theory proposes. These stakeholders should evaluate the theoretical and practical significance of the propositions developed by the researchers, and the internal consistency and parsimony (Table 1) of the propositions they have created. These stakeholders may be members of the wider IPE community, other than the research teams (Table 2). In our social capital example, these evaluations were captured through a day long workshop in which in the propositions derived from social capital theory were presented to a group of 17 individuals involved in IPE delivery

and curriculum development across the UK. Participants were recruited through the UK Higher Education Academy. For the majority of participants, the workshop was their first introduction to the social capital theory and in the interest of parsimony and internal consistency (Table 1), the research team made every effort to present the theory clearly.

Data collection

The workshop participants were divided randomly into four evaluation panels (3-5 participants each). Each panel was presented with one proposition to explore. Four relational propositions (RP) specifically were chosen for this exercise (see Table 3). The panel discussion was facilitated by a member of the research team who presented a schedule of set questions aimed at evaluating the sense, clarity and coverage of the concepts and proposition presented to the panel and the relevance of the proposition to the particular challenges of the IPSTG's composition and structure. Each session lasted an hour in duration.

TABLE 3 ABOUT HERE

Analysis

Recordings were transcribed by the research team and descriptive textual analysis conducted (Miles&Huberman,1994). A process of familiarisation took place via data immersion through reading and re-reading the transcripts. Key concepts were identified to construct a framework for communicating the essence of what the data highlighted. To promote the dependability of the qualitative analysis, an independent assessment of the transcript and themes was carried

out by DC and SH, achieving a high level of agreement. Findings are presented in relation to propositions explored in focus group discussions (Table 3). Please note that this analysis describes the participants' reaction to the proposition, not the results of testing the proposition itself. Examples of empirical studies in the literature that provide evidence that inform these propositions are included to illustrate the type of World One evidence required in future work needed to test these statements.

Ethics

Participants received an information sheet outlining the nature of data collection, and assuring confidentiality of data storage and anonymity in reporting. Written informed consent to digitally record and report group discussions was collected before panel discussions began.

OUTCOMES OF RELATIONAL PROPOSITIONS WITH REVIEW PANELS

Presented below is a summary of the sense and relevance each panel made of each of the relational propositions (RPs Table 3) presented to them and the alternatives or alterations they proposed in discussions. Keeping up the analogy with questionnaire validation mentioned earlier, this phase can be equated to the revision and reworking of questionnaire items following discussion with the panel reviewing the instrument. Panellists responses to the size and composition of the IPSG were strongly related and therefore RP1 and RP2 (Table 3) have been presented together.

RP1: The size of the IPSG influences the knowledge exchange between student members and

RP2: The professional composition of the IPSG influences knowledge exchange between student members.

Participants confirmed that exploring the influence of group size on student outcomes was of practical and theoretical relevance to the IPE community and that group size could influence the learning within the IPSG. They proposed that smaller groups are more effective at achieving learning outcomes as larger student numbers had a negative impact on group cohesiveness.

'I think if your groups are too large the bonding happens, at the expense of bridging..... all the nurses sitting there and the medics sitting there..... You are making things worse actually.' (Panelist 1, FG 1)

Participants proposed that students disengage or exhibit freeloading behaviours if groups were larger although recognizing a lack of skill mix within smaller networks. They found it difficult to distinguish group size and mix as concepts, a fact recognized elsewhere (Fay, Borrill, Amir, Hawad & West, 2006), but accepted the relevance of each as a concept in its own right. They believed that the multidisciplinary nature of the IPSG, and bridging rather than bonding social capital, were essential for the development of essential interprofessional competencies but reported variation in how this multidisciplinary mix was achieved, logistically. For some, different professions are equally distributed across the available IPSGs. In others, allocation is dependent

on the learning activity undertaken and the healthcare team being mirrored in practice. They did not offer any propositions as to which model might be preferable in achieving interprofessional learning outcomes but discussed the challenges of including peripheral as well as core professional groups in each team so that students are exposed to as many professions as possible.

'... I have to involve more professions than we actually can. At the moment ... we have a scenario and you think I wish there was a probation officer that can come here and tell us what's going on with this person with mental health issues.' (Panelist 4, FG 2)

The above discussion stimulated reflection on the impact of being the lone representative of a professional group within the IPSPG. On the one hand, these students may be marginalised and withdraw from the IPSPG.

'... they hate it. They feel out numbered. They feel that they are a lone voice they feel that nobody is listening to their views and their values and everybody else is health.'
(Panelist 5, FG 2)

Similarly, being the lone professional representative was identified as a distinct disadvantage if having other group members from your own professional group in the IPSPG is needed to sound out a developing understanding of one's own profession, as well as that of another. This need for bonding social capital reduced as students progressed through training.

“ we are finding a pattern where they are more interprofessional and less concerned about their own professional bonding as they get through the programme and get more senior. So, it depends on where they are on the course.’ (Panelist 5, FG 2)

An alternative hypothesis also proposed by participants is that lone professionals are forced to engage in bridging rather than bonding behaviours and hereby develop resilience to being the minority group member required in their future practice networks.

Feedback from the review panel on propositions related to group size and professional mix enabled the research team to refine, and add to, the original propositions to be tested. The following are examples of these:

- Smaller IPSGs result in improved knowledge exchange between student members
- Larger IPSGs promote freeloading behaviours in student members.
- Smaller IPSGs promote cohesion amongst student members.
- A professional mix that reflects a practice based scenario is more effective in achieving interprofessional learning outcomes than a randomly assigned professional mix.
- Lone professional representatives engage in more bridging behaviours in the IPSG than other students
- Members of peripheral professional groups are marginalized in IPSG activities
- A relationship exists between students’ bridging behaviours and the stage in professional training that IPE takes place.

Limited research is available that reports testing these, the original propositions associated with IPST size and heterogeneity and the impact on student learning outcome. However, evidence is more forthcoming in the evaluation of the healthcare team in practice rather than in the IPE/IPST context (see, Fay et al., 2006). This suggests that for some in the IPE community, the degree to which the IPST reflects the healthcare team in practice and the processes by which the size and multidisciplinary nature of the IPST can impact on student learning, is taken for granted. Fay et al. (2006, p553), tested this assumption in healthcare teams, rather than student groups, on the premise that “ a greater variety of perspectives, increase[s] performance [in] terms of the innovativeness of problem solving”. They point out that the impact of group heterogeneity is contingent on the outcome of interest but that if this outcome is the quality of team innovation, then the multidisciplinary mix is positively correlated to the quality of team innovation. However, team processes such as shared vision and high interaction frequency must be in place. These processes overcome the negative effects of social categorisation and distinctive mental models that work against multidisciplinary team working. They found that group size is independent of professional mix concluding that professional differences and individual difference offers teams the additional knowledge resources required to provide innovative outcomes (Fay et al., 2006).

Similar evidence in the educational context is not forthcoming although Baldwin & Baldwin (2007) prove an exception. They reflect on student teams (teams of Faculty working alongside students in healthcare teams in practice) and conclude that teams of more than four or five

professionals are impractical and do not affect learning or performance. Although this contradicts Fay et al. (2006), Baldwin & Baldwin (2007) qualify this with the fact that if skills are lacking in the team, students are able to negotiate with other teams/ faculty for help. An exploration of communication patterns within student teams by these authors showed that whilst interaction patterns differed between professional groups, it did not differ between teams. Although this is not specifically related to social learning outcomes, this finding suggests that the actual composition of the team may be of less importance than first imagined. To achieve a level 2 of analysis in World 1, other forms of evidence are now required in addition to these reflections to test opposing propositions further. Fay et al. (2006) and Baldwin & Baldwin (2007) acknowledged the importance of relationships within the IPSTG, a key focus of social capital theory, advocating that time is spent on team development processes.

RP3: The frequency of students' participation in the IPSTG influences the knowledge exchange between student members

The original intention of this relational proposition was articulating the relationship between frequency of individual activity (e.g. participation in online fora, physical attendance of team meetings) and knowledge exchange with other students. The validity of the proposition was acknowledged by participants and underlying processes proposed, (e.g. student attendance compromised by placement pressures and geographical distance separating team members). Professional differences in frequency of attendance were raised and believed to have negative outcomes:

'.. but the medics stepping in and stepping out when they want...it just really ..firms up their original ...preconceivedideas... conforming to stereotypes.....(Panelist 8, FG 3).

Review panel participants offered alternative propositions, at a curriculum level, viewing the frequency of participation as how often IPE modules appeared in the curriculum and over what time period. Institutional models varied widely, participants differentiating between intensive programmes concentrated over a short period (e.g. a full four days), versus more titrated approaches (e.g. one day a week over eight weeks), where students are consistently exposed to smaller but more varied interprofessional experiences. Logistics often overruled participants' wishes to increase the frequency of student participation in IPE.

Additional and refined propositions are therefore: there are professional differences in the levels of individual attendance in the IPSG; there are differences in students' knowledge exchange in titrated versus concentrated models of IPE curricula. Baldwin & Baldwin (2007) considered the latter proposition reflecting on titrated (what they called periodic) versus intensive interventions. They proposed that the former has logistical advantages being more easily integrated into the unprofessional timetables of participating Faculties. Intensive programmes offer more immersed experiences, however, free of competing pressures.

RP4: The level of participation in the IPSG influences the knowledge exchange between student members

Theoretically frequency of participation does not guarantee engagement in the IPSTG. The original intention of this proposition was to relate the student role in the IPSTG (e.g. a leadership role) to enhanced learning outcomes. Participants instead focused on the fact that not all students engaged equally in the IPSTG and discussed the factors behind this. They saw engagement as governed by students' perceptions of the relevance of the module to their professional education and some participants believed that this attitude came from Faculty staff in their parent profession. They proposed that a lack of engagement may derive from students' inexperience to group working as a pedagogic practice, a practice they may not be familiar with in their professional arena. For others, previous exposure to IPE led to the accumulation of negative expectations that they transfer and invest in the next IPSTG even though the membership of these new groups may be different to their previous experience:

'I have had students in the past, who have got a defined, what they expect to come to on the day, so they may have had a negative experience in the past of interprofessional education so they come with a set agenda.' (Panelist 12, FG 4)

Engagement is not only self-determined. Participants reported students being marginalised by other group members or by virtue of the structural make up of the group. In either case, IPE educators hypothesised that exclusion led to a lack of access to social capital within the learning group and that skilled facilitation was required for social capital to accrue for all group members.

From the above the following propositions were developed: there is a relationship between perceived relevance of IPE and the levels of knowledge exchange; students early experiences of IPE influence their attitudes later in their training; and students resistance to IPE derives from their resistance to group learning and not IPE itself. Although no literature was found that explored relationships between the student's team role and social learning outcomes, student engagement and leadership in IPE design and delivery has been shown to be pivotal in the sustainability of IPE interventions as a whole as this higher level of engagement has been suggested to enhance their willingness to collaborate (Hoffman, Rosenfield, Gilbert., & Oandsan., 2008).

DISUCUSSION

The paper has presented an approach to validating a theory within the IPE context and illustrated how propositions are developed/validated using social capital theory as a case study. To develop a range of testable propositions, a concept analysis of social capital theory was drawn upon to break it down into to its constituent concepts. From these concepts a range of existence, definitional and relational propositions were developed and validated with a review panel group of IPE educationalists. This activity led to the refinement or addition of new propositions. However, to obtain empirical adequacy for social capital theory (Table 1) these propositions must now be tested, using empirical indicators of the concepts identified alongside the appropriate research designs.

Whilst some concepts are easily measurable (e.g. frequency of participation in the IPSPG), others (such as the sustainable and dynamic nature of social capital) are not. A first challenge is to identify a measure of social learning, or zone of *interprofessional proximal development* as a key social advantage of being a member of the IPSPG (Vygotsky, 1978). The dimensions of social capital that are contingent on the development of this outcome could then be explored. There are wide ranges of learning outcomes and/or competencies associated with IPE (Freeth et al., 2002; Barr, 1998) but the processes behind these, particularly the dimensions attributable to social learning, are unclear.

Although many of the propositions appear obvious to the experienced IPE educationalist, a preliminary scan of literature to identify exemplar studies that explored the propositions developed suggested that they are taken for granted and hence remain unexamined. There is little emphasis on the quality of social relationships between students in the IPSPG, the antecedents to these, the impact of these social relationships on learning outcomes or the sustainability of these relationships. An in-depth review of the literature to identify the existing evidence of the IPSPG characteristics that lead to the highest levels of social learning within the IPSPG is required before primary research begins. This gap in the evidence base, alongside the practical relevance of social capital confirmed by IPE educationalists established both the theoretical and practical significance of this theory (see Table 1).

In this paper, we have utilized only one dimension of social capital by way of illustration.

However, the other concepts/propositions briefly alluded to above need to be explored and

refined, particularly those that explain the accumulative, sustainable and dynamic nature of social capital. Systematic reviews of the effectiveness of IPE show there is little evidence that the gains made by IPE are sustained over time (e.g. Lapkin, Levett-Jones, & Gilligan, 2011) and we would put forward that this sustainability is key to the social capital construct. Furthermore, refining and testing the propositions put forward in this paper will provide evidence to support our understanding of the processes and structures that need to be present in the IPSLG that allow this to happen.

We found that our review panel participants were able to engage easily with the concepts of social capital. However, the most tangible of social capital dimensions was chosen for validation as the other dimensions may have proved more ambiguous to this audience and have lesser parsimony and internal consistency (see Table 1). We established W2 level 2 validity of the theoretical propositions through discussion of these with a sample of IPE educationalists. To achieve a higher level of validity, alternative theoretical frameworks should be presented in parallel to social capital to determine if social capital was a *preferred theoretical option* (Table 2, W3 Level 3) or if other frameworks had greater explanatory power on similar phenomena. Some participants referred tangentially to the contact hypothesis (Carpenter, Barnes & Dickinson, 2003) as a theory to be used in tandem to social capital. Future validation could therefore identify and classify the phenomena these two theories explain and explore whether these compete or complement each other in explanatory power.

LIMITATIONS

The ontological approach taken in this paper has been a strongly positivist one. As in debate around positivist and constructivist research approaches and the methodologies these promote, a positivist approach to theory has its strengths and limitations. By testing or validating a theory deductively within the IPE field, we take the stand point that we have a wealth of theory in other more established disciplines to guide our practice and that we will benefit from testing the usefulness of their theorising within our own, rather than reinventing the theoretical wheel. This does mean we are potentially importing a framework into IPE that has derived from a different context and imposes a structure on this topic that may not be contextually relevant. We acknowledge the equal value therefore of more inductive approaches to theory development, particularly the use of grounded theory to generate theory constructed within the IPE context. Here establishing the trustworthiness and credibility of the emerging theory will take centre stage rather than the validation of an existing one as proposed in this paper. Further, positivist approaches tend to focus on establishing a truth, and are critiqued for not acknowledging the possibility of multiple realities. By developing valid propositions derived from social capital theory and testing these empirically in the future, we believe we may be establishing one version of what it is to develop good IPE, but acknowledge that other theories will present different but equally valuable versions of this truth.

CONCLUDING COMMENTS

Reeves et al. (2010) stated that “the multi-faceted nature [of IPE interventions] limits our ability to identify the role that each intervention plays in the outcomes achieved”. This is exacerbated by a focus in evaluations on the outcomes of IPE (see the popularity of the Kirkpatrick model of

learning outcomes -Freeth et al., 2002); less is written on the group structure and quality of group relationships required to achieve these outcomes. We argue that for IPE interventions in which small group experiential learning is the form of curriculum delivery, testing the propositions derived from social capital theory, will establish first the characteristics of the IPSG each intervention uses and then the impact of these on student outcomes. Hereby evidence is created, not only on whether IPE is an effective intervention, if compared to uniprofessional delivery (e.g. Reeves et al., 2010; Lapkin et al. 2011) but on the *type* of IPE intervention that is most effective.

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