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Abstract:
The discourses around globalisation and internationalisation within higher education to date have tended to focus on institutional change. While recognising the importance of these debates, this paper suggests that issues around curriculum change and teaching and learning through global professions such as health and engineering have so far been largely neglected. Using evidence from the UK and Ireland, the paper looks particularly at how students perceive the importance and value of global perspectives to their professions. It concludes by noting that there is evidence of interest in integrating global perspectives within health and engineering degree courses from students, but that this raises major challenges concerning discipline-based knowledge, valuing differing perspectives, and approaches towards teaching and learning.

Keywords: Globalisation, internationalisation, global perspectives, global citizenship, engineering, medicine, pharmacy, veterinary science

Douglas Bourn is Director of the Development Education Research Centre, Institute of Education, University of London, editor of the International Journal of Development Education and Global Citizenship and author of numerous articles and publications on global citizenship, global perspective in education, development education and education for sustainable development, email: d.bourn@ioe.ac.uk

Nicole Blum is Lecturer in Development Education at the Institute of Education, University of London. Her research interests include education for sustainable development, environmental education, global health, and the anthropology of education , email: n.blum@ioe.ac.uk

Introduction

The relationships between globalisation, internationalisation and higher education have been a major topic of debate of the past decade. Some academics and students see these challenges as a vehicle for posing larger questions about the wider purpose of learning within higher education in the UK (Sterling, 2004; Shiel, 2007; Killick, 2006) and there are emerging examples of movement towards creating more 'globally competent' professionals in a range of disciplines (see Clifford and Montgomery, 2011; Bourn and Neal, 2008). This might include the addition of new curriculum content, new opportunities for international study or work, and new approaches to teaching and learning.

The purpose of this paper is to review the implications of the debates on internationalisation and globalisation for higher education programmes for health and engineering professions, and to explore how students within these subjects perceive the value of learning about these areas in relation to their own training and future careers. The paper draws on work from research and development projects that are being undertaken by, or have involved, the Development Education Research Centre at the Institute of Education, University of London.

Work with health professionals has been based around a DFID-funded Development Awareness Fund project called 'Students as Global Citizens' that began in 2009. It is a collaboration between the Institute of Education, the Institute for Global Health and the School of Pharmacy[i] at University College London, the Royal Veterinary College and the London International Development Centre. Work with engineering professionals was based initially around another DFID-funded project led by the NGO Engineers Against Poverty with the Institute of Education entitled 'The Global Engineer'. Follow up research to this initial project was also conducted with a self-selecting group of approximately 100 university students from 6 universities in the UK and 30 undergraduate students at the National University of Ireland in Galway. Evidence was also gathered from a follow up DFID-funded project in the UK again led by Engineers Against Poverty entitled 'The Global Dimension to Engineering Education'.

These projects used a range of research methodologies such as observations, interviews, and focus group discussions with students and other key stakeholder groups. Particularly key for the discussion in this paper are surveys which were conducted with health and engineering students at appropriate points – i.e. where global perspectives were being raised within teaching – to explore their impacts on learning as well as students' perceptions of the value of these themes to both their studies and future careers. These surveys were of varying lengths depending on the circumstances in which they were used, and also covered a range of global issues depending on their relevance to particular professional groups. Details of specific surveys are provided at appropriate points in the following discussion.

It should be noted that all of the universities involved in these projects were self-selecting, i.e. those that were interested in 'global perspectives' or were in some form or other already working to include them within aspects of their curriculum or teaching and learning activities. The evidence cited in this paper is therefore not intended to provide a representative sample of the many diverse perspectives on global issues which exist within universities in the UK and Ireland that are engaged in the training of health and engineering professionals. However, we believe that it does provide a useful indication of both the key opportunities and challenges that characterise work in these areas, as well as making a contribution to the emerging body of work which explores global perspectives within higher education more generally.

While the focus of this paper is the UK and Ireland, references are made in the wider discussions on internationalisation and debates on global health and engineering to similar research in North America and Australia.

Rationale

The introduction of new approaches to teaching and learning about global issues, in particular, raises significant issues about the nature and boundaries of disciplinary knowledge, the range of professional competencies which are required in an era of globalisation, and wider perceptions of the purpose and goals of professional education programmes. While there is a growing body of literature which has begun to explore these questions from the perspective of educators and institutions – for instance, in terms of curriculum development, teaching and learning approaches, and the potential to cultivate students as 'global citizens' (Unterhalter and Carpentier, 2010; Schattle, 2008; Stearns, 2009), relatively little research has explored students' own ideas and perspectives on these issues.

In this paper we argue that student perspectives are key to work in this area for several reasons. Students are best placed to articulate their own motivations and interests, and as a matter of principle ought to be consulted in curriculum development and revision processes. By doing this, educational institutions and programmes are better able to take account of students' existing interests and enthusiasms in order to prepare students to become globally competent professionals. Changes made to programmes without taking account of students' perspectives are more likely to encounter resistance due to inaccurate assumptions about student interests, the inclusion of content that is not considered to be relevant, and/ or the use of unappealing or inappropriate teaching and learning approaches. This is particularly important given the diverse perspectives that exist amongst student groups – with some students strongly advocating the inclusion of global issues in training programmes and others uncertain about their relevance to their professional development.

Health and Engineering

Health and engineering are excellent examples to use to explore the relevance and influence of internationalisation and global perspectives on professional

development. Not only do they have a clear global context in that their key skills and knowledge bases are arguably relevant throughout the world, but they are also professions that have a high degree of economic and social mobility. In addition, they are areas of work that are key to global social and economic change.

However, as of yet there has been relatively little debate on the impact of global forces on the skills needs of these professions, particularly in terms of curriculum change or approaches towards teaching and learning. The focus has instead tended to be on the inclusion of additional bodies of knowledge, which in themselves become questioned within an overcrowded curriculum. (see Bourn and Neal, 2008; Bateman, Baker., Hoornenborg and Ericsson, 2001). These are often provided in the form of optional 'extras'. For example within medicine and health related courses in the UK, students are most likely to have opportunities to learn about global issues as part of optional sessions (e.g. one-off lectures or workshops), specialist programmes (e.g. intercalated global health degree programmes are offered in a few UK medical schools), extracurricular activities (e.g. through involvement in student societies), or self-organised (usually short-term) overseas voluntary placements. (Bourn, McKenzie and Shiel, 2006; Bourn and Neal, 2008). By their very nature, this tends to lead to students with an existing interest in global and development issues being the most likely to pursue these kinds of activities. The greatest drivers for teaching and learning about global health concerns therefore continue to be either individual staff who choose to incorporate relevant content and themes within their teaching or students themselves.

Within the health professions, however, there is also growing recognition of the need for professionals who understand and are prepared to cope with global health concerns. The term 'global health' has gained increasing prominence over the last several decades, although it has many interpretations. At its most simple, 'global health' describes processes that operate at the level of the whole world, and can be distinguished from 'international health', which operates between particular countries (cf. Kickbush 2002; Howson et al 1998). Harden (2006) for examples asks in relation to medicine, 'Are we giving (students) the skills necessary to practise as clinicians and doctors within the 21st century global village in which they will live?' (Harden, 2006: S28).

Importantly, global health is not only about health issues at the global level, but also concerns local impacts. For example, the health of immigrant communities can be understood within the context of global trends in population mobility. Global restructuring of industries with health-related impacts (e.g. tobacco, food and drink, pharmaceuticals) have both individual and population health impacts. Thus, global health also concerns the links between different levels of analysis, and includes the study of health in developing counties, health issues concerning two or more countries (at the border), health issues that cross national borders (cross border) and health issues that transcend territorial boundaries (trans-border).

Global health concerns are not just limited to an interest in human health, as veterinary professionals also play a key role. As a consequence of

environmental and population changes, animal and zoonotic diseases which were in the past restricted to the tropics are now increasingly seen as global threats. Meanwhile as demand for high protein food resources grows, veterinary scientists have a significant part to play in international livestock production.

The increasingly rapid global movement of both people and animals means that these issues are of relevance to health practitioners and researchers working both in the UK and overseas. The global dimension within the education of health professionals is therefore about recognising that healthcare is a global industry and an integral part of efforts to improve health and well-being around the world. There is growing recognition that to be a 'global health professional' requires not only that young professionals have an understanding of health concerns and practices in other countries and of the global context of their discipline, but also that they recognise the contribution that health research and practice can make to global economic and social change (cf..Johnson et al, 2011; Frenk et al, 2010)

Over the past decade, engineering practice and education has also increasingly begun to address questions of ethics and changing societal needs related to globalisation. This has taken a number of forms:

- Recognising the impact of globalisation on changes to how companies relate to rapidly changing economic circumstances (Camuit, 2006);
- Making connections with more values based and social responsibility agendas (Royal Academy of Engineering, 2005a);
- Putting sustainable development as an integral component of engineering courses (Royal Academy of Engineering, 2005b);
- Promoting the contribution engineering can play as a contribution to combating global poverty and the millennium development goals (Pate, 2006).

While there is evidence of a recognition of the importance of these agendas within engineering in countries such as the UK and Australia (cf. Spinks, Silburn and Brichall, 2006; Loxton, Raison and Etheridge, 2006), two major issues can be identified from dialogue with academics, representatives of professional bodies and students. Firstly, a lack of confidence, commitment and expertise to give these themes prominence within the profession and universities. They are implicit and covered in a variety of ways, but there are not many examples where the concept of the 'global engineer' is recognised as an added advantage in terms of the skills needed to be a good engineer. Secondly, there is a need for time and space within courses to provide the resources required to effectively address global questions.

Globalisation, Internationalisation and Higher Education

To assess the importance of and challenges for global perspectives within health and engineering, it is necessary first of all to recognise the impact of globalisation and the debates around internationalisation within higher

education more generally. While much of the discourse around these areas has centred on the economic impacts of globalisation on higher education (cf. Burbules and Torres, 2000; Unterhalter and Carpentier, 2010; Edwards and Usher, 2008), the writings of Beck (2000), Kenway and Bullen (2008) and Jarvis (2007) have included a recognition that globalisation raises new challenges particularly in terms of where, what and how people learn.

Beck, for example has noted that learning in response to globalisation needs to take account of 'flexibility' as well as 'social competence, ability to work in a team, conflict resolution, understanding of other cultures, integrated thinking and a capacity to handle uncertainties and paradoxes of secondary modernity' (2000: 137-138). Similarly, Suarez-Orozco and Qin-Hillaird (2004) suggest that the nature of globalisation engenders complexity and that this necessitates a new paradigm for learning, including the need for skills to recognise different perspectives, to work in a more flexible manner and with diverse groups of people.

Globalisation also poses a range of challenges and questions in terms of where and in what form people learn. For example, instant global access to information and knowledge is likely to have significant impacts. A key question is what type(s) of learning this kind of access to information facilitates and, given the varying degrees to which individuals and groups have access to new information technologies, what the implications are for global social and economic equity. Secondly, how does increased social mobility, contact and dialogue with people from a wide range of cultural backgrounds impact on people's understanding of the wider world? Thirdly, what are the impacts of events taking place elsewhere in the world on what and how people learn in a specific locality? Finally, as a consequence of globalisation, learners face myriad cultural influences which impact on their sense of identity and belonging (Kenway and Bullen, 2008; Jarvis, 2007).

While some of the emerging discussion around globalisation and education (and particularly the work of Jarvis, Bullen and Kenway) has argued that learning needs to be more 'global' in outlook, there has been less discussion around the direct impacts of globalisation on learners and on the skills that learners need to develop to make sense of these complex forces. For instance, for a range of reasons, including economic, cultural, environmental, people will need to understand and engage with different viewpoints and perspectives. As Burbules and Torres (2000) comment:

> 'The global context presents a fundamentally different sort of challenge to education than in the Enlightenment framework. Whereas previously education was more focused on the needs and development of the individual…. education for life in a global world broadens the outline of community beyond family, the region, or the nation. Today the communities of personal affiliation are multiple, dislocated, provisional, and ever changing. (2000: 21-22)

Internationalisation strategies can, and in some instances do, provide openings for new and different approaches. As Caruana and Spurling (2007) suggest in

their review of literature on internationalisation in higher education, the discourse can 'entail a shift in thinking and attitudes' and the accompanying pedagogy can move beyond a narrow economic focus to incorporate social, cultural, moral and ethical dimensions. There is evidence in the UK, for instance, of higher education strategies that link globalisation and education to opportunities to re-think curriculum content and learning so that differing cultural perspectives and critical thinking are recognised and valued, and concepts of global citizenship are promoted (cf. Bourn and Shiel, 2009; Jones and Brown, 2007).

Indeed, higher education institutions around the world are increasingly recognising these challenges and exploring ways of addressing them. This has taken a variety of forms including:

- Consciously promoting the university as a global institution, particularly by encouraging recruitment of international students and developing partnerships with universities elsewhere in the world (Stephens, 2009);
- Recognising that students are increasingly likely to live and work in different countries around the world and that they therefore need to have a more global outlook and to see themselves as 'global citizens' (Schattle, 2008; Stearns, 2009; Lewin, 2009);
- Revising degree courses to take account of different perspectives from around the world and to encourage critical reflexivity (Bourn, Mackenzie, Shiel, 2006);
- Addressing the challenges of sustainable development both in terms of campus ethos and course content (Gough and Scott, 2007).

Overall, these discussions suggest that central to higher education responses to globalisation is a need to identify and support learners in developing (i) the skills to make sense of what is happening around them, (ii) the ability to recognise diverse interpretations and viewpoints, and perhaps above all (iii) to know how to deal with uncertainty and complexity.

Global Perspectives for Global Professionals

The development of these skills and competencies is perhaps particularly relevant within higher education programmes for young professionals. Perspectives on what kind of knowledge and skills should be encouraged are, of course, clearly linked to the specific social context or nature of each profession as well as national context.

To assess the changes currently taking place within professions and to identify potential opportunities for further changes to curricula, teaching and learning approaches, and avenues for informal student engagement in the UK, we argue that two pedagogic imperatives must be recognised. The first is the 'need for the creation of new world citizens with proper knowledge of, skills for, disposition applicable to, the globalised world' (Fujikane, 2003: 143). The second is the need for new kinds of curricula that can meet that need.

We therefore propose that an approach called *global perspectives within higher education* should be adopted. This approach was developed by a team of UK academics in partnership with members of non-governmental organisations who are supportive of development education principles and practices (Bourn, Mackenzie and Shiel, 2006) and who see global perspectives as:

- Understanding our situation in a wider context
- Making connections between local and global events
- Developing skills and knowledge to interpret events affecting our lives
- Learning from experiences elsewhere in the world
- Identifying common interests and exploring wider horizons.

In essence this entails a bringing together of internationalisation, sustainable development, globalisation and understandings of global issues within a pedagogical framework that promotes different perspectives and approaches to learning, and encourages social and political engagement through the concept of global citizenship. Developing a global perspective therefore requires the broadening of curricula and the incorporation of pedagogic approaches that empower students to develop as thoughtful and critical beings who are able, when necessary, to challenge orthodoxy and bring about change.

In more practical terms, this means not only incorporating particular themes (e.g. sustainable development, global forces and processes, the role of the student as a global citizen), but also attending to the content and nature of the learning taking place. As Schoorman (2000) suggests, this is an approach that can challenge dominant notions of learning and encourage a more balanced representation of perspectives from around the world. It also supports students to reflect upon and incorporate their own social and cultural experiences within their learning.

Student Perspectives on Global Learning

There is evidence from a number of universities that students highly value opportunities to learn and engage with global questions both within the formal curriculum and outside it. Research at Bournemouth University, for example, showed that university students welcome the opportunity to engage in debate about global issues and global processes, with 80% of the students surveyed seeing global perspectives as relevant to their lives and stating that they would like more opportunities to develop ‘broader global perspectives’ while studying at university (Bourn and Neal, 2008: 10). It is perhaps not surprising then, that students are increasingly demanding that universities provide more opportunities to engage with global issues and sustainable development:

> Students today live in a global society – a society where they cannot ignore global interdependence and global inequalities. ….How are today's students going to find their individual roles in a global society? And where do they start? …. Awareness of the world has heightened the

> curiosity of students about their role in a global society….. Unless students find themselves roles to play, there is a risk of disenfranchisement or of disillusionment: that they are aware of global issues but do nothing about them' (Lamb, Roberts, Kentish and Bennett, 2007: 17).

At the same time, while students are increasingly interested in learning and engaging with global and development issues, it is also important that their own ideas and perspectives are taken into account. The statement above, for instance, is taken from a paper first produced by representatives of three student-led organisations for discussion with voluntary organisations, policy-makers and practitioners in education. Entitled 'Students as Active Global Citizens', it argues that the frameworks and approaches through which global learning and engagement is encouraged need to recognise students' right to determine the nature of their own contribution, rather than merely responding to proposals either from university administrators or external interest groups (Lamb et al, 2007).

The enthusiasms from students involved with that initiative came in part from the recognition that learning about global issues is directly relevant to their future careers. This interest can also clearly be seen through the activities of a range of student-led networks and organisations. In engineering, for instance, the student-led network, Engineers Without Borders UK provides opportunities for students to take part in engineering-related placements in developing countries. Similarly, in health, the medical student organization Medsin has branches at universities across the UK. They coordinate activities that aim to 'promote health as well as to act upon and educate students about health inequalities in our local and global communities'. They have produced a Global Health toolkit that aims to provide resources and ideas that may not be addressed within their formal teaching at their university (Medsin, 2011). Similarly, students in these professions also show their interest in global issues through volunteering or taking part in extra-curricular projects in another country. This can be seen from both the priorities of the student led networks referred to above and within the published material (Bourn, McKenzie and Shiel, 2006; Bourn and Neal, 2008; Harden, 2006; Johnson et al, 2011).

Despite such evidence of active engagement, however, our research has shown that students often have highly diverse ideas about global issues. In particular, our work with engineering and health professionals has highlighted four key themes related to students' perspectives which deserve further attention: the perceived relevance of global issues to professional development, understandings of what constitutes the 'core knowledge' of a discipline, ideas about where global and development issues should be taught within the curriculum, and opinions about the relative value of particular kinds of teaching and learning approaches.

Are global issues relevant to students' professional development?

Central to any effort to include new topics and perspectives within teaching and learning is the need to show their relevance to students' professional development. While the discussion above highlights a range of strong academic

arguments for the inclusion of global perspectives and issues within professional programmes, their relevance also needs to be made clear to students themselves. Without this, students may be more likely to prioritise other areas of study. This is perhaps particularly the case for professions where the demands of a programme are already heavy, and students have to make strategic choices about where and how to focus their energies.

There is evidence to suggest, however, that many students already see the relevance of these topics and perspectives to their professional development and are keen to learn more about them. In a survey of 175 students at the School of Pharmacy, London, for instance, 44% of respondents stated that they think it is 'very important' and another 47% that it is 'important' for pharmacy students to learn about global and development issues as part of their training. While approximately 61% of those surveyed think that all undergraduate pharmacy students should learn about these issues, the remainder believe that only those with a particular interest should.

Similarly, in a survey of 150 first year students at the Royal Veterinary College, 87% of the group either strongly agreed or agreed that veterinary education should prepare professionals to work overseas at some point in their career. Within the group 95% also stated that they believe that overseas experience would be beneficial to their professional and personal development, and 74% said that they would like to work overseas at some point in their career. Within medicine too, the recent growth of undergraduate programmes and modules on 'global health' within many UK universities signals an increasing demand for training that explores global issues and perspectives.

Similar evidence of interest in global issues within engineering was found in a survey with approximately 50 students from a number of institutions in the UK (Bourn and Sharma, 2008). In this case, issues related to sustainable development – which is part of the curriculum specification for engineering degree courses – was of particular interest. 80% of the students surveyed felt that learning about global and sustainable issues would further their careers. This understanding was most noticeable amongst those students who had studied engineering alongside another subject and from those who studied civil as opposed to mechanical engineering. There was also a significant decrease in the perceived value of learning about these issues from the first to the fourth year (Bourn and Sharma, 2008: 200). The reasons for this are difficult to assess without further research but suggest that as they get closer to securing a job, technical skills appear to them to be more important. Yet research conducted at Cambridge University and Imperial College by Engineers Without Borders with past students found that those who had shown interest in global issues secured better degrees and more high profile posts within companies relative to their peers who lack this motivation (Bourn and Neal, 2009: 9).

Using a similar methodology to that adopted in the UK with engineering students, research was conducted with engineering students from National University of Ireland in Galway on their views about the relevance and value of learning about global issues. Here the research was conducted through a questionnaire with a cohort of 25 undergraduate students at the end of a

seminar. While there was interest in including global and sustainability issues within the curriculum, the concept of the 'global engineer' had not been posed as an integral component of the curriculum in Galway. The responses from the students in Ireland about the value of the global dimension were therefore surprising. The first question they were asked to consider was whether employers would value engineering graduates who have a commitment to positive world change. All of the students said 'yes', and offered the following observations:

- *'Gives impression of being a smarter person'*
- *'Will make better decisions if more aware of global impact of decision*
- *'Shows a willingness to adapt'*
- *'Employers are looking for engineers of international standard'*
- *'Responsibility to the environment - this going to be even more important in years to come'.*

The second question was specifically in relation to sustainable development and whether an understanding of this area would help with their career. Again the overwhelming majority of students answered 'yes' and a number of observations were made about the future importance of sustainability, particularly in specific areas such as planning or for those hoping to work in a developing country.

A theme that emerged from the comments of a number of students was that the 'global dimension' would broaden their horizons and give them skills to make them more employable:

- *'With the world becoming a lot smaller, and students travelling more, there is a need for graduates to become involve in topics/ projects internationally. At the moment we are simply taught how our skills can be used at a national and local level.'*
- *'I believe that in the coming years those engineers who have knowledge on global issues will be more attractive to employers.'*

These observations from students demonstrated an interest in including global and sustainability themes within their courses. They also saw these agendas as relevant to their future careers. If there was any caution from the students about these agendas it was, as one commented, 'it hasn't been promoted to us… we haven't had the relevant information' (Bourn, 2009: 6).

Similar evidence can be found from research undertaken at Northumbria University as part of a Higher Education Academy mini project in 2010 and 2011. Forty-three students from a range of engineering courses completed an online questionnaire on their views on the relevance and value of learning about global and sustainability issues within their degree course. 95% of those who responded felt that it was necessary to learn about sustainability in an engineering course. The area was felt by them to be now a major part of everyone's lives. (Montgomery et.al., 2011).

How do global issues and perspectives relate to the 'core knowledge' of a discipline?

While it is clear is that student interest in global issues and perspectives is strong, and growing, a related question – which we hope to explore further through our research – is precisely how students prioritise this learning relative to other topics or skills. For instance, what do students opt to take when given the choice of opportunities to learn about global issues or to focus on developing clinical or technical expertise in their field? In other words, how 'important' do students' perceive global issues and perspectives to be in relation to more traditional areas of learning within their chosen discipline?

Research for the DFID funded Students as Global Citizens project suggests that one of the key barriers to integrating global issues and perspectives within undergraduate health degree programmes is resistance – on the part of some institutions, individual educators and students – to making space within crowded curricula for what are perceived to be 'soft' skills. These might include the ability to recognise and value different perspectives, to work in a more flexible manner and with diverse groups of people, and to communicate effectively. While many health professionals might recognise the value and importance of such skills in their own practice, the perception that mastery of 'hard' scientific knowledge is the foundation of professional development remains very strong within many training structures and institutions.

In engineering, students' views were influenced by the extent to which they were actively interested in global issues on a personal level. For example, those who students who were members of Engineers Without Borders saw themes such as poverty and development as key to their future careers. However, this was not the dominant view from the other students who responded to the questionnaire. The majority emphasized more the technical professional needs to be a good engineer and to fulfil the basic requirements of courses. (Bourn and Sharma: 2008).

The engineering students in Ireland saw the Global Dimension as not only relevant but would make their course more interesting. As one student stated 'Global engineering being introduced into the curriculum would make active learning more important and therefore the learning of the course more interesting' (Bourn, 2009). A theme to emerge from the research at Northumbria was the opportunities these areas created for a range of curriculum approaches and methodologies including lectures and seminars but placements, design modules and closer relation to practical experience. The importance of practical and 'real life experiences' was highlighted as a theme from the dialogue with students. Overall the students involved in the research at Northumbria felt the 'global engineer needed to be a multiliterate all rounder, who may be multilingual, culturally diverse and aware of different unit applications (Montgomery et.al, 2011: 4).

Where should global issues and perspectives be included?

It is perhaps this tendency to see such 'soft' skills as of secondary importance that has led many health training programmes to offer global health learning opportunities as optional, rather than part of the core curriculum. Within

medicine, for example, global or international health programmes (e.g. modules or intercalated degree courses) are commonly seen as 'specialist' areas of work and of interest only to a limited number of students.

Evidence from student engagement in the Students as Global Citizens project suggests that around 15% of students in medicine, pharmacy and veterinary medicine are actively involved in global health either through optional study choices, extracurricular activities (including student-led groups such as Medsin) or overseas placements. This reality stands in marked contrast to student perceptions about the importance of learning about global issues and perspectives. In the survey of students at the School of Pharmacy, for instance, 45% stated they these should either be solely part of the core curriculum or within both the core curriculum and other optional opportunities.

Within engineering, global and development issues have also either been included as part of optional or elective modules or as extracurricular activities. At Imperial College and Leeds Metropolitan, for example, themes such as sustainable development and global social responsibility were taught as distinct modules (Bourn and Neal, 2009: 18). This perception of global and sustainability issues as important but as additional to the core was also noted in comments from a number of students in the research by Bourn and Sharma (2008: 201). Similarly, in the research at Northumbria (Montgomery et.al. 2011: 10) while some saw sustainability as key to all modules, others felt it should be taught separately.

Internationally, in Australia through the leadership of Engineers Without Borders, a competition was designed called the EWB Challenge for students to develop projects within their core degree courses. Evidence from the competition suggests that it has led students to develop a much broader understanding of their roles as engineers in the wider community (Browne et.al.: 2010)

What value do students place on particular kinds of teaching and learning approaches?

Students are also likely to have strong opinions on the effectiveness and helpfulness of particular kinds of teaching and learning approaches, especially when related to the development of professional knowledge, skills, and competencies. While 'traditional' teaching strategies in the health professions have tended to focus on lecturing methods (i.e. 'chalk and talk' or 'sage on a stage'), for instance, there is a growing movement towards the use of problem-based learning and assessment strategies within UK higher education (e.g. Objective Structured Clinical Examinations; cf. McRobbie et al 2006).

The Students as Global Citizens project has been piloting an interdisciplinary scenario-based workshop for students studying medicine, pharmacy and veterinary medicine around the theme of avian flu. The workshop is designed to provide participants with the opportunity to work in interdisciplinary teams and to explore the ways in which health professionals need to work together to manage an outbreak of zoonotic disease. The workshop format is very similar to that used for government exercises undertaken at national and international

levels. Participants are split into small groups who then 'act out' the roles given to them (e.g. local health professional, national ministry officials, international health NGOs, multinational pharmaceutical interests, media), consider what response to make to the problems set, and report back to the whole group at various points in the workshop. The scenarios and problems are expected to produce varying viewpoints, and intended to provoke an open discussion. The purpose of the exercise is therefore not to come up with 'right answers' to the questions (there is often not a single right answer in any case), but to explore complex issues of communication, emergency response coordination, resource integration/ prioritisation, problem identification and resolution, and inter-professional working. Many students report that participation in the workshop is the first time that they have had the opportunity to explore these issues through discussion with peers, and that it stands in marked contrast to the lecturing methods which often characterise their degree programmes.

Nevertheless, some educators have also noted that not all students welcome these kinds of new teaching methods. One leading educator at the University College London commented, for instance, that when they have tried to implement problem based learning approaches within the core medical curriculum, many students tended to resist this and not to see the benefits of learning to work in a group or developing team-working skills. Similarly, in response to an evaluation question [*Do you think that the case scenario sessions are useful, or would you prefer another format (e.g. a different kind of small group task, a lecture, or something else entirely)?*] about the teaching methods used in one global health module, for instance, fourth year medical students gave a diverse range of replies:

> *'I enjoyed the group task. It is the first time I have ever been personally involved in thinking about international health.'*
>
> *'Not really. I fail to see how this will impact upon my ability as a clinician.'*
>
> *'I would prefer tutorials and not to have to do a presentation - we already have so much to do, so it is just an extra thing.'*

Similar observations can be found in engineering. To understand global and development issues requires a recognition of looking at different perspectives and approaches, critically reflecting upon your views and noting that there is not one answer or simple solutions. Student surveys at Imperial College show some engineering students, particularly those who excel at mathematics and science, struggle with non-technical subjects and non-lecture based learning (Bourn and Neal, 2008: 21). As one engineering student said to this research team '*does that mean I will have to write an essay - I haven't done that before at this college*'. Montgomery et al (2008) found similar trends from their research with students at Northumbria. They noted: 'students continued to struggle with modules that required them to contextualise scientific and technological aspects of what they were learning into "problems" and "real world" examples' (2008: 3).

These themes suggest that some of the resistance to changing teaching methods may be due to familiarity, as many trainee professionals will have

focused their earlier studies in the natural sciences and so may be more familiar with content-based teaching and assessment strategies (e.g. lectures and multiple choice exams). But it may also be related to the previously mentioned hierarchies of knowledge that tend to place mastery of scientific 'facts' above the development of 'soft' skills.

Conclusions

The challenge of globalisation for higher education is about much more than responding to economic agendas and the marketplace. It requires both academics and students to recognise the relationship between their professional needs and skills required to live and work in a global society that is increasingly fragile, uncertain and insecure about its future. This paper has aimed to demonstrate that despite students' growing interest in global perspectives within health and engineering degree courses, introducing these issues and approaches raises important questions around knowledge, skills and above all pedagogy.

While research around these issues is at too early a stage to draw firm conclusions, our work in both health and engineering in the UK and Ireland has found that the obstacles to progress and change often result more from institutional inertia than from either a lack of demand from students or external forces. For instance, the tendency for global issues to be included as part of 'optional' modules or sessions within degree programmes both limits the number of available student places and may also implicitly suggest that such topics are only of interest as a specialist area of work, rather than being important for all young professionals. Similarly, the perception that global issues represent an entirely new area of content which cannot be easily added into already-packed curricula tends to limit the potential to find creative ways of incorporating global issues within existing areas of teaching and learning.

What is noticeable is that in all of the professions discussed in this paper there are strong student networks that see their professional needs and being a global citizen as strongly related. Medsin, for example state that their mission is: 'To create a network of students, empowered to effect tangible social and political change in health on a local, national and global level through education, advocacy and community action'. Similarly, Engineers Without Borders has as one of its aims to: 'educate students about development work, in order to build capacity in the development sector, and to change the attitudes of coming generations'.

Despite such active efforts, however, a significant proportion of students may still see global issues as a specialist area, and therefore not a relevant part of their training. This may be largely a result of a simple lack of opportunities for engagement and discussion with global issues. A number of students taking part in the pilot workshop on avian influenza as part of the Students as Global Citizens project, for instance, noted in their feedback that having an opportunity to engage in in-depth discussion of global health concerns during the workshop had shown them how important global issues are to their professions. This

suggests that – when given the opportunity – students are often enthusiastic about engaging with these complex ideas and developing their global knowledge and skills.

Although this paper has focused largely on our work in the UK and Ireland, there is also an emerging body of evidence from other contexts which underscores the need for 'global perspectives' to be encouraged internationally. Recent research on the professional education of social workers, lawyers, engineers, public health professionals and theologians in South Africa, for instance, argues that despite increasing global market pressures, higher education institutions should play a role in 'educating public good professionals who will make the responsible choice and have the knowledge and practical skills to function in the interests of people living in conditions of poverty' (Walker et al, 2010: 1). While the focus of such work in South Africa might understandably be on preparing professionals to address local and national concerns, a similar range of 'global' skills – including the ability to recognise different perspectives, to work in a more flexible manner and with diverse groups of people, and to understand the links between local and global events and circumstances – are also clearly indicated. Much more research is needed, however, to understand the relevance of global perspectives in diverse international contexts.

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[i] Formerly the School of Pharmacy, University of London.