Design, genomförande och utvärdering av internationella kurser för framtidens hälso- och sjukvårdspersonal

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Euro-Education: Employability for all (EEE4all)

Design and implementation of an international course for future health-care professionals

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Abstract. Background: Employment is a priority in the European Union, and it is essential to address the needs of individuals disadvantaged at the labour market on grounds such as ethnicity, age, gender or disability, to increase the opportunities for these groups to gain employment. The Council of the European Union recognize the important role of national organisations in increasing gender equality and the need to integrate a gender perspective in all policies. Gender equality perspectives should also, according to the EU Plan of Action and Gender Equality be integrated in education. Objectives: To equip students in higher education with knowledge, about gender, age, disability and ethnicity in relation to employability, a European group initiated a project; Euro-Education: Employability for all (EEE4all). Approach: The project, funded by the European Lifelong Learning Programme, was aimed to develop and implement four course modules, each relating to employability with different focus: gender, age, disability or ethnicity. In this paper design, implementation, and evaluation of the course focused on gender, provided by the Occupational Therapy Programme at Linköping University, is described. Conclusions: The students highlighted the importance of awareness and knowledge about gender theory and its application in relation to employability and client-centred approach.

Keywords: Occupational therapy, gender, e-learning, vocational rehabilitation, course design

1. Introduction

Work is high on the agenda for governments across Europe, and employment has been made an absolute priority under the revised Lisbon Strategy [1,2]. There is no single or universal definition of employability; however there is a general agreement that the concept is centred on work and the ability to be employed. A person's capability to gain employment is defined as employability, and depends on the knowledge, skills and attitudes of this person. Further, rules and regulations on the labour market have a significant impact on the possibilities for an individual to gain employment. Therefore, a person's specific knowledge and skills might result in different opportunities in various national or regional labour markets [3].

Named as one of the key areas within the objectives of the EU commission there has been a call for countries within the European Union to address the needs of individuals who are excluded from the labour market and disadvantaged on grounds of ethnicity, age, gender or disability [4]. There is a need to develop innovative strategies to increase the opportunities afforded to these groups in relation to accessing employment. The Council of the European Union recognize the critical role of for instance national organisations in increasing gender equality and the need to strengthen resources in order to ensure that a gender perspective is integrated in all policies. Further, the Council emphasize the importance of equal access of women for instance to employment, education and vocational training in order to advance the empowerment of women [3]. Gender equality perspectives analysed from the interests of
women and men respectively, to obtain gender disaggregated data and to perform gender analysis in investigating differences between women and men in a given context, should according to the EU Plan of Action and Gender Equality and Women’s Empowerment in Development [6] be integrated in for instance education. About 10% of the active population across Europe are unemployed today and the EU has set out 13 key actions aimed at reforming labour markets, upgrading skills and matching them with market demand. This is intended to boost employability and make it easier to move jobs, to improve working conditions and job quality, and to create jobs [7]. Estimates show that by 2015, the EU will lack 2.7 million skilled workers in the IT, health and research sectors.

Gender equality may be one of the factors supporting women’s increased participation in the labour market and employability assuming that the policy environment favours more equal shares between men and women in paid work, as well as care work, and equal income [4]. The relationship between men and women can be seen as a part of a larger pattern of gender relationships in all sectors in society – the so-called gender order present at individual, organizational, and cultural levels – and may be one of the structural factors impacting on the ability to gain employment [8]. The gender order means the structurally organized relationships between men and women in society, in relation to the distribution of work and resources as well as power. The gender order permeates the labour market in different ways. For instance, occupations become gendered as they are characterized by qualities, attributes and behaviours assigned to men and women. In most societies women as a group have been less successful in negotiating their place in the gender order [8]. Women and men, as a consequence of the gender order, live under different conditions, have different experiences, and use different strategies because of social, cultural, ethnic, and political circumstances, as well as biology [8]. Women have been shown to have a higher total workload as a consequence of their greater responsibility for taking care of children and performing unpaid work, which results in greater overall exposure to physically demanding activities and psychosocial strain. It has been shown that a large part of the total physical load and psychosocial strain derives from activities outside work, and that is more common for women than men [9]. Pascoe and Lewis [10] suggest a model from a wider European perspective in which paid and unpaid work are equally valued, and equally shared between men and women. They also emphasize that such obligations concerning paid and unpaid work must be underpinned by social rights in order to achieve gender equality, and the breadwinner model should be discarded.

Further, in studying differences between men’s and women’s occupational and non-occupational risk factors for mental health [11] it is demonstrated that non-occupational risk factors are more common amongst women. These include, for instance, poor quality of social contacts, physical inactivity, and high perceived physical load outside work. Occupational factors such as shift work, job strain, and low occupational pride were related to poor mental health among women. The authors conclude that these patterns can partly be explained by the gender-segregated labour market, and partly by other explanations. It is likely that occupational and non-occupational factors interact and contribute, and must therefore be considered [11]. Women’s less privileged living conditions have been shown to be associated with ill health of different kinds [11–13]. Studies have shown higher sickness absence among women than men, especially in gender-segregated occupations [14].

It is important to understand gender as a variable, influenced by culture and constructed by daily human interaction. The concept of ‘doing gender’ is based on an understanding of gender as a social construction, and according to Courtenay [15] gender is not inborn, but shaped/constructed through notions, meetings, negotiations and behaviour in social life [15]. Men and women are actors/actresses in these socially constructed relationships, and are in that way ‘doing gender’. The awareness of the impact of the structural gender order in society which has a focus on ‘doing gender’ has been investigated previously amongst health professions [16, 17]. The results have shown that the professionals were ‘doing gender’ in their encounters with clients, and a lack of knowledge concerning gender aspects was obvious. For example, they focused their questions on different areas in their assessment of the client: for female clients, household and family; for male clients, their paid work situation [17]. A qualitative study [18] also showed these gendered structures in the rehabilitation system. The authors conclude ‘men’s behaviour and goals seem to be more in line with structures in the rehabilitation system, and when clients, doctors, and social security officers act the way they usually do, men are favoured. In order to improve rehabilitation for women, both doctors and social security officers should be aware of how gender is constructed in the consultation” [18, p. 94].
Therefore, there is a need for increased knowledge and education for health and social professionals regarding employability and how gender can have an impact on opportunities to participate in the labour market. Gender-related factors might be decisive for, or contribute to, women’s difficulties in the labour market, and should be considered seriously in order to increase possibilities for employability. To be unaware, as a professional, of your values, thoughts and previous experiences can lead to a situation in which the professionals reproduce a non-reflective approach, including stereotypical expectations, communication and treatment, which can be considered as an adaptation to the gender order existing in the culture as a whole [19]. The EU Plan of Action and Gender Equality and Women’s Empowerment in Development [5] emphasize that specific action is needed to support the advocacy capacity of stakeholders, and to increase knowledge and establish a deeper understanding of the influence of the existing gender order for men as well as for women may be a first step to improve gender equality. Therefore gender equality perspective should be integrated in higher education [6].

2. The project: Euro-Education: Employability for all (EE4all)

The role of higher education is to equip students with knowledge, attitudes and behaviours needed in the workplace, along with the ability to gain initial employment, to maintain employment, and to be able to move around within the labour market. In an effort to meet the need of increased knowledge of the aspects; gender, age, disability and ethnicity, in relation to employability, an European project group with partners from five institutions (Table 1) initiated a project, the EE4all during the period 2008–2010 in which the partners worked together to develop and implement new and innovative course modules. In addition to the four participating universities, ENOTHE (European Network of Occupational Therapy Education), which is a network consisting of over 200 occupational therapy educational institutions, professional associations, employers and client organizations across Europe. The role of ENOTHE in this project was to assure that the TUNING methodology [20] was implemented in a correct way in different modules, and to maintain quality and assure compatibility with EU directions. The TUNING process is an approach intended to (re-)design, develops, implement, evaluate and enhance quality in education, and includes a methodology supporting course modules designed to find a common language and structure [20]. It was used by the university partners involved in the project. The project was funded through the European Lifelong Learning Programme [21] and focused on the development of a European course module aimed at equipping future practitioners with the skills to meet the present and future needs of those furthest removed from the labour market, which are discriminated against on grounds such as disability, age, gender or ethnicity. The intention was to provide students on Bachelor and Master level with the opportunity to work alongside other students across Europe in order to draw on a greater wealth of resources and provide the students with the opportunity to both reflect on and share learning on an international platform. In addition, they were able to develop greater cultural sensitivity and understand the national and European policy documents and literature. Further, the TUNING process [20] has been the key in this process of harmonizing the course modules, representing a unique opportunity for occupational therapists and other professions in Europe to describe their professional education following common reference points in terms of level, competences, learning outcomes, workload, and profile. The project group decided to develop four course modules, each relating to employability but with a different focus (Table 1). The modules were aimed at students with an interest in employability, with a focus on gender, age, disability or ethnicity (e.g. occupational therapy, physiotherapy, social work, nursing, public health on dif-
2.1. Course design: Enabling employability for all-focus on gender

In the following text the course module with a focus on gender, as implemented by the Occupational Therapy Programme at Linköping University is described. A national organisation, The Swedish Public Employment Services (stakeholder) and expert in social medicine and gender theory took an active part in the development and implementation process. The course module consisted of 15 European Credit Transfer System (ECTS), and required full-time study over a ten-week period. ECTS is a standard for comparing the study attainment and performance of students of higher education across the European Union and other collaborating European countries [22]. Students from the four partner institutions studying at bachelor or masters' level were invited to participate. A total of nine students took part in the gender module (2 Swedish, 2 German, 3 Dutch and 2 English students) at Linköping University, Sweden. The module consisted of tutorial groups, lectures, tasks and seminars (Table 2). The initial three tasks during the first eight weeks were related to the learning outcome concerning evaluation of key concepts, principles, evidence, theories and/or social policy impacting on employability on a national and European level. The students performed a critical overview regarding laws and regulations that govern the labour market as well as identifying actors at the labour market responsible for unemployment services and vocational rehabilitation. The following tasks focused on a gender perspective in relation to the labour market. Initially the students conducted a literature review on the distribution of men and women on the labour market in each country (e.g. full-time and part-time work, educational level, age, wages, activity patterns, sick leave). Then an analysis of the review was performed in order to identify the gendered order for men and women in the labour market. The final two weeks comprised an exchange (face-to-face) period at the Occupational Therapy programme at Linköping University where students had the opportunity to apply the new skills and knowledge in practice in real contexts in another country or in the home country. In order to facilitate the students own reflection upon values and opinions on diversity they participated at a seminar on equal opportunities with an expert from Linköping university. As preparation before the face-to-face period started, the students collected data from a stakeholder by interview to be used in the final assignment. The students' final assignment was to design a detailed course outline (i.e. specific content, pedagogical approaches, economical aspects, marketing) for employees within the stakeholder organisation, aimed to increase their knowledge about gender impact on employability for men and women. The students worked in their tutorial groups and at a final seminar they presented the course outline for tutors, gender experts and a representative from the stakeholder organization. The presentation also included a critical reflection of the implementation of the course outline in their respective country.

2.2. E-learning applications

During the initial eight weeks, different information and communication systems were used in which students shared experiences, and undertook specific enquiries within their own countries. They could then share these with each other. E-learning comprises all forms of electronically supported teaching and learning activities and is essentially the computer and network-enabled transfer of skills and knowledge [23]. The action plan for E-learning from 2001–2004 [24] ex-
explains how E-learning fits into the context of Europe, i.e. how the use of new multimedia technologies and the Internet can improve the quality of learning by facilitating access to resources and services as well as exchanges and collaboration. The participants in this course module used different E-learning applications for communication (Fig. 2). In the tutorial group work the students used Adobe Connect Pro as a web communication tool, and combined this with programs for presentation such as PowerPoint while presenting their assignments. The Blackboard E-learning platform was used to distribute course materials of different kinds. E-lectures, recorded in advance, and uploaded on the learning platform were given to the students during the course module and were available during the period of the course. The software platform, Skype, was used by students to communicate with each other. Further, the web-based application Xtranormal was used to create short 3D animated movies from simple text-based movie-scripts for an assignment.

3. Student and teacher evaluation and overall assessment by the EU Commission

3.1. Evaluation — Enabling employability for all-focus on gender

A continuous evaluation was performed in tutorial groups, tasks and seminars where students and tutors were involved in the feedback process. The final evaluation of the course module consisted of an oral feedback from the nine students. Further, a questionnaire, common for all four modules, focusing on the students' expectations, the international dimension, the e-learning environment and the interaction with tutors and students was used.

The students' evaluation highlighted the importance of being aware of their own assumptions in relation to their future profession. The students also reported that they had increased their awareness and knowledge about gender theory and its application in relation to employability and the client-centred approach. All
students mentioned that they had developed new skills when working in groups containing people from different countries. The students as well as the teachers evaluated the E-learning applications as a prerequisite for managing the course but they were also a challenge as there was sometimes difficult to fulfil the technical requirements and the technical support was crucial for the realisation of the course module.

The teachers' evaluation resulted in a recommendation that a future course module should be decreased in length for easier adaptation into a regular curriculum. This would facilitate the students' possibilities to fully concentrate on the course module. The preparation for students as well as lecturers could be improved by providing a basic introduction on the possibilities and how to handle the E-learning applications.

3.2. Overall assessment by the EU Commission

The overall assessment of the EEE4all project by the EU commission showed that the project had succeeded in creating innovative educational models that may be of great assistance to institutions and practitioners throughout Europe. Therefore the project received a global score of 8 out of 10 from the Commission.

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Running A European Internet School – OTIS at Work

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This paper discusses the OTIS experience in providing Internet based courses to student and professional occupational therapists in four centres across Europe. It uses a problem based learning approach to promote collaboration between students based in several different European countries, who study and evaluate the different strategies for assessment and treatment of patients across Europe.

Some of the issues arising from the development of this pilot course are discussed, together with the experiences of the project team in bringing it through to a successful pilot. These have included not only technical matters, but also managerial, pedagogic and classroom control issues that are often neglected. Only if all these are addressed can large-scale distance-learning activities be developed.

1. Introduction

This paper discusses the OTIS (Occupational Therapy Internet School) experience in providing Internet based courses to student and professional occupational therapists in four centres in the UK, Belgium the Netherlands and Sweden. The OTIS consortium is currently running a full award-bearing pilot module in “High Level Assistive Technology in European Occupational Therapy”. The pilot course started with twenty-three students registered from all four participating Occupational Therapy Schools, who are also all providing tutorial input on a course-wide basis. The course uses a problem based learning approach [1] to promote collaboration between students. All students complete:

1. a reflective account of their learning progress in relation to assistive technology.
2. one completed case study, concerning either a younger or an elderly client.
3. one critical review of a second case study completed by one of their European counterparts, and concerning the alternate age group to that above

A similar approach has been followed elsewhere, for example at Roskilde [2].

2. The OTIS System

The system has been developed specifically to facilitate the educational and collaborative philosophy, while being sympathetic to a non-technical user base. Above all, the technical design has to facilitate a high degree of synchronous (real-time) communication [3]. This permits groups of people to meet both formally in weekly tutorials and in an ad hoc manner, to discuss different matters separately from other groups who might be meeting at the same time.

The course materials interface has been developed using a Virtual Campus metaphor [4]. The Virtual Campus comprises a number of virtual rooms such as the library, student work areas, etc. This facilitates navigation around the OTIS site, as students readily identify the purpose of each room, and know intuitively what activities would take place in that room.

The virtual rooms also provide the means by which groups of users can congregate to discuss specific issues with every occupant of that room. This provides an effective way in which a group can discuss for example Case Study 1, at the same time as another group is discussing Case Study 2 in another room. Both students and tutors can book rooms dynamically in the Room Booking area, and invite the other members of their group to attend. Once understood, this has proved very popular and is used extensively for both formal and informal meetings. There was initially a problem with participants finding the rest of the group, since they can move around the virtual campus. A Page facility allows direct communication with one or more individuals, wherever they are on the system, and can be used to locate and shepherd wayward members of the group, or to conduct personal conversations.

The organization of the OTIS library, within the problem based learning model, generated much debate. The problem based learning approach requires that students should not be told the answers, but encouraged to find solutions for themselves. It was important that items in the OTIS library should not be described in too much detail in a cataloguing system, but some guidance for students was felt to be desirable. Students have only a limited time to complete their coursework, and much time can be wasted in checking out websites. Early thoughts were to
categorize the library into casual topics, such as physical disability, learning difficulties and ageing. On examining the library materials, it quickly became apparent that many materials spanned several topics. For example, an assistive technology device might be equally appropriate to a physically disabled person or an old person with difficulties with mobility. Establishing a list of keywords, and attaching keywords to each library material, has solved this problem. A library search facility allows all materials matching specific keyword combinations to be identified.

3. Evaluation of OTIS Progress

It is clear that OTIS is seen as an educational environment, rather than purely as a technical system. Students mostly join the course in order to share experiences with students and tutors in other countries. Students in the first pilot found that their interactions with people in other countries were an enjoyable and highly motivating part of the course. Students did, however, feel that they would like more guidance on how to prepare for online tutorials. This feedback was extremely important in developing the final course structures. Students viewed the case studies as giving either too much or too little information, and the problem-based learning approach does not allow tutors to give information to the students. In the main pilot, experts (e.g. representatives of companies marketing assistive technology devices) are available in communications sessions to answer questions about the products. This has proved very popular with students, as has the opportunity to conduct online consultations with patients (or in practice, tutors role-playing patients).

Facilities are provided through the "Staff Room" to allow tutors to meet in private, and regular Staff Meetings have ensued. This has proved very important for the cohesiveness of the course, as immediate issues have been dealt with effectively as they occur.

Classroom management has been an issue with all tutors as the environment has been very new. New techniques have had to evolve to ensure that tutorials take place at the right times, and everyone is present. The synchronous nature of the online tutorials has at times put a considerable strain on the computer networks, and individual group members have missed parts of the discussion. The facility to record online discussions in meeting rooms has been of great help here, as the transcript can be used to fill in any missed comments, as well as acting as a highly informative record of the tutorial.

4 Conclusions

The OTIS project shows that problem-based learning techniques can be used effectively in a distance-learning environment to bring members of a highly practised profession together across many different countries. This allows experiences to be shared across a wide range of problems and best practices to be disseminated rapidly across many national boundaries. An important feature of the OTIS course structure is the use of multi-national tutorial groups and tutorials. The relatively high level of synchronous communication encouraged by the system means that mock consultations are practical, and the use of role playing characters means that they are easy to arrange, as different tutors (or indeed students) can act the patient whenever necessary. This leads to an extremely dynamic and flexible learning environment, in which students, staff and others interact much more closely than with electronic mail based tutorial systems.

The regular liaison and negotiation between all parties closely mirrors the advanced communication necessary in a team of health professionals who are aiming to deliver a best possible integrated health care package to a consumer. In the case of OTIS, the student as the consumer needs to both experience the results of such integration, and be trained in the methods to achieve such ends.

As with all projects of this type, much more needs to be done. The advantages of synchronous communication are considerable, but meetings need to be arranged, and diaries coordinated. This is done at present through the use of timetables and electronic mail, very much as one would within a regular University Department, but as the groups grow larger and more diverse, this becomes increasingly difficult. An online diary management and booking facility would be a considerable advantage for all concerned. Meetings could then be arranged fully within the system.

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References

The provision of education and training for health care professionals through the medium of the Internet

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Introduction

Evidence of ongoing competence to practise is now in increasingly high demand across a broad range of professional service providers. General practitioners and health and social care professionals understandably figure prominently in this category and there are recent well-publicized examples of disastrous blunders that have occurred when competence is not upheld. Most health care professionals are bound by statutory and renewable licensing schemes and there is now a powerful drive to link licence renewal to evidence of ongoing study that brings practice up to date. Thus lifelong learning has moved into the general arena as an essential element of proof of competence to practise.

One group of health care professionals that now has a statutory requirement to undertake continuing professional development is the membership of the British Association of Occupational Therapists. In order to continue to hold a licence to practise, members must agree to abide by the published Code of Ethics and Professional Conduct (College of Occupational Therapists, 2000). This document contains the clause:

Occupational therapists shall be personally responsible for actively maintaining and developing their personal professional competence, and shall base service delivery on accurate and current information in the interests of high quality care (College of Occupational Therapists, 2000).

As any occupational therapist can be “struck off” for not complying with the above Code of Ethics the importance of accessible programmes of ongoing professional development is brought into perspective. Like

The OTIS project is funded by the European Union through the TEN-Telecom programme. The system is based on CoMentor, developed by the University of Huddersfield, whose help in setting up the system is gratefully acknowledged. Certain of the software described in this paper was developed by the following MSc students at the University of Liverpool under the direction of two of the authors: Theo Hagos, Lee Kempson, Simon McCormack, Neil Mitchell and Alan Tierney. Further information may be obtained from the OTIS project Web site, http://www.csc.liv.ac.uk/~otis/where sample course content can be viewed.
all professional groups of the twenty-first century, the membership of the Association of Occupational Therapists is diverse in character and age range. A common factor, however, is the realisation that most group members will have busy professional and personal lives: for them day release courses or ten-week-long programmes of evening classes are no longer a viable option. Flexibility of learning delivery and acquisition is now a key attraction. The course topics that each therapist will wish to study will clearly depend upon individual career pathways and sites of employment. There are, however, core topics that apply to many practice settings: assistive technology is one such core topic.

The occupational therapist and assistive technology

Occupational therapists, together with other allied health professionals, are at the forefront of rehabilitation teams in their work of enhancing and facilitating independence for people with wide ranging impairments. Occupational therapy remains a notoriously difficult profession to define, largely because of its wide sphere of practice. It takes clients from cradle to grave, meeting their needs due to a wide range of both physical and psychological impairments, and always in line with their environmental and cultural needs. It is accepted that debate concerning definition continues (Townsend, 1997), with many erudite writers joining the forum. There is, however, universal acceptance of basic values or core beliefs which all occupational therapists share, and that recognizes the central concept that a healthy human being will need to carry out personally meaningful activities. This concept of occupational performance is currently defined:

Occupational performance refers to the ability to choose, organize, and satisfactorily perform meaningful occupations that are culturally defined and age appropriate for looking after one’s self, enjoying life, and contributing to the social and economic fabric of a community (Townsend, 1997, p. 30)

It is not difficult to envisage the vital role that advanced technology plays today, in the therapist’s enabling work, to ensure that all clients are able to achieve their highest level of occupational performance, no matter what their level of impairment. Frequently the severity of a client’s impairment plays an important part in the sophistication of the assistive devices that are needed to overcome dysfunction. At the start of the new millennium, therapists and clients in developed countries are in an enviable position, because advanced technology can be harnessed in an effort to provide a client with a wide range of choice and maximum independent function even when the initial impairment is severe. We see this in such instances as clients with quadriplegia who are enabled to be independently mobile, driving a high tech adapted car on the road and a specially modified power chair indoors.

In order for any client to receive maximum assistance from technology it is essential for the therapy team to be fully informed and up to date concerning the options and range of products available. To date it is widely recognized that there has been a failure to exploit the potential of enabling technologies (Cullen and Robinson, 1997). This is due to a number of factors, not least of these being a shortfall in technological awareness among care professionals dealing with clients (Green, 1997), although amongst occupational therapists this situation is now improving (Sixsmith et al., 1998). At the initial level, then, students must be made aware of technology’s potential, its possible applications and contraindications which must be considered. At a postgraduate level, therapists in specialist settings need regular updating, to keep their knowledge current. Occupational therapy educators are aware of the enormity of this task. The HEART Report (European Commission, 1995) recognized this, whilst advocating that: “education and training are probably the most efficient ways of influencing the future in any sector of the society”. This report goes on to recommend:

A European curriculum with similarities between the European countries, is of great importance for the development of assistive technology, for addressing the needs of the elderly and disabled and to form a single market in this field (European Commission, 1995, p. 18).

IT suggests a model appropriate for both pre and in-service training, which links the user to the environment via the technical components
which address communication, mobility, manipulation and orientation.

Occupational therapy educational programmes are employing an increasingly wide range of methods and media in order to meet both resource and economic constraints and the diverse needs of a broad range of students. Today's undergraduate students may range in age from 18 years to 48 years, with commensurate personal and family responsibilities. Postgraduate students will display an even wider range. Therefore there is a great need for flexible, alternative course delivery strategies to be explored. OTIS is designed with these aims in mind.

Problem-based learning for medical and health professionals

Medical and health-related courses are currently designed to produce practitioners who are effective in multi-disciplinary teams, who are client-centred and holistic in their practice and who are informed users of research that in turn enables their evidence-based client care. Such attributes have been repeatedly recommended in commissioned Department of Health reports during the last ten years (Department of Health 1989, 1997, 1998).

In meeting these demands it is necessary for students on health-related courses to become active learners, in experiential settings where appraisal skills and independent use of resources are fostered. Such skills too are compatible with a life-long learning stance where each practitioner will assume an individual responsibility for ongoing learning and enquiry, long after initial training is complete.

At the heart of many models of experiential learning is the problem-based approach. "Problem based learning has now been in use for more than twenty-five years and brings many real benefits to health professions' education" (Davis and Harden, 1999). Some of the recognised benefits are:

- a deeper approach to learning is encouraged, not merely the learning of taught facts, memorised in order to pass an examination;
- integration of knowledge is encouraged, so that the whole patient in his environment is studied, rather than a list of signs and symptoms;
- essential core skills are fostered, such as problem solving, communication and team working.

The starting point for learning "should be a problem, a query or puzzle that the learner wishes to solve" (Boud, 1988). Medical courses which use a formal problem-based learning approach are systematic in the way the cases are presented; study is conducted via small groups, each facilitated by a tutor, and face-to-face feedback sessions are held regularly. The OTIS course, being Internet based, is not appropriate for the formal structure of problem-based learning groups. However, the concept of a problem solving approach is pertinent as in their professional capacity occupational therapists work in small focused groups most of the time. Hagedorn (1992, p. 50) makes some important comments about the problem-solving model, which are relevant to the OTIS cases:

"The problem solving process is a conscious attempt to avoid the assumptions and blinkered thinking which may be inherent in other models, and to view the patient holistically and objectively before deciding on the nature of the problem and how (or if) to treat it... One of the features... is that it may highlight that the "problem" does not lie with the patient, but with her physical or social environment."

Rationale for OTIS

Many educational institutions are now recognising the potential of the Internet in the marketing and delivery of education and training (for example Rada, 1998). The flexibility and immediacy of the delivery mechanism allows new learning paradigms to be developed that can be radically different from existing arrangements for either local or distance delivery. In the particular model developed for the Internet School, the objective is to develop professional skills through problem solving in groups with members from different countries and backgrounds, enhancing the learning experience for all participants.

Some of the advantages in offering courses through the Internet school are:
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- the ability for participating institutions to brand and market an extensive portfolio of attractive courses as their own;
- liaison among the teaching staff of the networked universities;
- accreditation of course and individual modules in each of the networked states;
- offering the course to students outside the normal geographic and subject catchment areas of the networked universities;
- making courses viable that could not otherwise run;
- combined promotional activities among the networked universities;
- sharing expertise of educationalists.

It is recognised that different educational consortia may wish to collaborate in different ways and the aim is for OTIS to provide a flexible structure to allow Internet schools to be constituted according to the requirements of the user institutions. In the present case, the school is “directed” by a partner that was recognised as a leader in the particular domain. The other partners within the network enrol students from their own catchment area and provide tutorial support within their areas of expertise. Within this, one scenario could see students buying the courses from their “local” university, that in turn purchased the course from the course director. An alternative scenario could see the student purchasing directly from the course director, that in turn would pay for “local” tutoring support. Both scenarios are fully supported in the OTIS environment.

The basic architecture for an Internet school

The prototype Internet school consists of four universities interconnected via the Internet. The current configuration is shown in Figure 1. Students are able to access the Internet school either from within a university using the normal routes to the Internet or from outside using a dial-up connection to an Internet service provider. This allows students and staff to participate in the same groups, whether they are working locally or from either home or work. All that is required is an Internet connection to the Internet school server (at present in Liverpool). The four universities currently taking part have comprehensive network infrastructures already installed specifically for teaching purposes and internal students are using these facilities effectively. A major feature of the OTIS project is for students to use the Internet school to study, as part of their assessment for the award of a degree or other qualification. This will allow us to properly evaluate the requirements for active participation over the Internet.

The overall structure of the current system is shown in Figure 2. The applications involved fall into two major categories:

(1) those required to provide the student and tutor interfaces;
(2) those required for the effective management and administration of courses.

We are currently concentrating on the first, which is critically important to the acceptance of the OTIS concept. Groups need to communicate if they are to work together effectively.

Developing the interface

There are a number of models for supporting this in the educational context. Two were
considered in some detail and simple prototypes were developed so that student reaction could be assessed. These were:

1. A set of shared and individual folders that could be accessed through a Web interface and participants could participate by calling online meetings, specifying the participants.

2. A more interactive system, based on the technology used for distributed multiplayer adventure games that provided the means for students and teachers to meet both formally and informally by entering the same location or room within the learning environment.

Initial experiments used the shared information spaces model, where students could leave documents, Web links, etc., in a hierarchical structure of folders and comment on their own and other students’ documents by way of annotations. This allowed a fully documented discussion to be built up and tutors could see immediately how the group were developing the project, and whether everyone was contributing fully. Synchronous meetings could be arranged through special folders and all the documents associated with them collected in the same place, for use by all the participants. The plan was to arrange tutorial sessions with simulated subjects and to provide the support material in the form of briefing notes in the same place. This proved to be very unpopular with a trial group of students, even though the supporting software (BSCW (Applet and Mambrey, 1999)) is widely used to support collaborative working environments. Students were concerned about the lack of information as to who was in close proximity and could see what they were currently doing, without their knowledge. This is often called “lurking” and could be used as a strategy for other groups to overhear what was happening. A positive sense of who could “listen” to current conversations was considered essential.

The same group was also presented with another paradigm, that of virtual rooms, with different course activities in each one. Interaction was between individuals within a room, although a paging mechanism was also provided that could be used to call other participants to a particular location, or to conduct one-to-one private conversations. Access controls were visualised as whether particular users can enter each room. In these early pilots the only communication available was a “chat” window as part of the Internet interface and a small typing window through which participants could send their contributions. Feedback as to who could listen was provided by information messages as people who entered or left the room, and pop-up windows giving lists of the occupants of the current room and all currently active members. Conversations could be recorded for personal purposes, so that records could be maintained for future study and analysis. This simple model has proved very effective with occupational therapy students, and was rated very highly in a recent more extended pilot session. The initial trial was based on the CoMentor software package (Gibbs et al., 1999) and this has been adopted for further development.

CoMentor was always only intended by its authors to support the communication aspects of the course activities. Its interfaces to static course materials are therefore comparatively weak. Also, all communication is text based, students typing messages to each other in chat boxes. This minimises the network bandwidth required, but may not be sufficient for some of the applications proposed within the OTIS environment. A major requirement for the OTIS system is for students to locate, discuss and evaluate both local course materials and information obtained over the Internet to establish the most appropriate answers to the
set case studies. This has led to considerable development effort to ensure that each student group can collate these materials effectively and develop a coherent answer. Both audio and visual material are also incorporated into the course materials to enhance the presentation of the course materials. This has further been enhanced by providing facilities for both tutors and students to role-play the subjects (and other significant parties) in each of the case studies.

Opportunities also exist to exploit the full functionality of current, commercially available Internet applications. These additional services can be provided through standard helpers for, for example, inter-group communication. We are currently investigating the most effective means of integrating these facilities to ensure maximum educational benefit. Special meeting rooms have been developed, that are "furnished" with the facilities necessary to support particular activities, such as online group discussions, "lectures", patient consultations or exhibition booths in which commercial organisations can display their wares and discuss requirements with the students.

Developing the system

The pilots that have already taken place indicate that the geographic metaphor of the learning space is highly effective, but that considerable care is required in its design and presentation, if the students are to use it to its full extent. The base system, built around CoMentor, had only a limited number of locations, some with confusing functionality within the context of the OTIS pilot course. This has been considerably enhanced to provide a much greater variety of working areas, as shown in the map in Figure 3. These have intentionally been defined to be generic, so that the same map can be used as a basis for further courses. Another development has been the development of a standard set of "furniture" that can readily be used to add functionality to different rooms, rather than having to build it into the room infrastructure itself. An example is the provision of notice boards etc. This is now a standard component that can be used anywhere that it is considered necessary for students and/or tutors to leave messages. Not only does this make it much easier to provide the required functionality wherever it is needed, but the human interface is very much improved as it behaves in a standard way. Areas can also be modified very rapidly if necessary, in response to feedback from both staff and students.

Table I gives the set of rooms as currently defined. The principal rooms are shown on the map around the main entrance area. Supplementary rooms such as consultation rooms and the exhibition area are reached through a corridor off the main area. This allows the maps of these corridors to be generated dynamically, so that only those rooms currently active are displayed to the student. An example of this is a virtual exhibition area where suppliers of occupational therapy equipment can display their products and services. Both staff and students can enter these virtual booths and discuss the display, either openly with the company, or simply between themselves and leave messages. A company representative may be available at certain times for online discussion, or appointments can be arranged for virtual consultations. Since the contents of the booth are specified in HTML, companies can present a wealth of multimedia material, and provide links to other online resources to demonstrate their wares.

A similar model is used for online consultations, where students can enter a
Table 1: The current set of rooms in the OTIS virtual world

<table>
<thead>
<tr>
<th>Room</th>
<th>Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance hall</td>
<td>The first room encountered on logging in. This room will contain the Notice Board for important messages of the day.</td>
</tr>
<tr>
<td>Library</td>
<td>Room containing the tutors' resource materials.</td>
</tr>
<tr>
<td>Meeting rooms</td>
<td>Meeting rooms for students, tutors and others. These rooms are created dynamically when meetings are arranged. The discussions in the meeting can be recorded for future reference.</td>
</tr>
<tr>
<td>Patient consultation room</td>
<td>A room where virtual consultations are held with patients. These rooms contain various types of information about the subjects of the case studies, and other relevant people, such as relatives, cares etc. Once this material has been reviewed, students can conduct online “virtual consultations”, with tutors (or students) role-playing the major characters.</td>
</tr>
<tr>
<td>Exhibition area</td>
<td>An area where company representatives (and others) can display posters and other material either for the duration of the course or for a more limited period. The representatives can define times when they will “man” their area, and can meet students and tutors here, so that they can discuss their posters and provide additional information.</td>
</tr>
<tr>
<td>Computer help desk</td>
<td>An area allowing students to access technical documents and on-line technical tutorials. This is also where problems are reported, and a general queries and answers list is built up over the course of the course. The area may be manned by technical staff from time to time.</td>
</tr>
<tr>
<td>Student café</td>
<td>A students-only area permitting informal discussions between different groupings of students who are online at the same time.</td>
</tr>
<tr>
<td>Staff common room</td>
<td>A tutors-only area permitting online discussions that can not be overhead by students. The student's desk, giving individual access to e-mail, portfolio etc.</td>
</tr>
<tr>
<td>Student work area</td>
<td></td>
</tr>
</tbody>
</table>

consultation room and review the collected material, which includes written case notes, recordings of interviews etc. They can then conduct an online consultation with a “virtual patient” in the form of a tutor (or possibly a student) role-playing that character.

Figure 4 shows a typical student interface to the OTIS environment. On the left are a number of areas giving information and course materials, and the right hand areas deal with communication with other students and tutors. The picture on the top left changes to show the current location, and acts as an active map in most areas. In the entrance hall this is simply the map of the OTIS world, and allows access to all the requisite rooms. Each room is “furnished” with the appropriate facilities for the work to be undertaken in it. To the right of this is a menu, giving access to the materials in the current room. This allows students to select material as they require it, simply and effectively. Once it has been selected, it is displayed in the lower window. Navigation out of the room is by means of the picture. Clicking on the various doors takes you back either to the main circulating area or to various “corridors” that give access to more specific areas.

Students prepare their work in their own study areas and can place it in appropriate locations for review by both tutors and other...
Further work

Designing and implementing the virtual course world is currently a complex task, involving both computing specialists and occupational therapists. Much handcrafting is currently required to build the environment. This is because there are no clear divisions between the core system, the overall geography of the OTIS world and the course materials. If students are to navigate this world effectively, one would expect that the geography should be closely related to the course structure, and so should be readily configurable by the subject specialists. Some progress has been made, but considerable further work is required before this could possibly be achieved.

Students can find an online learning environment highly intimidating, and there is a major role for “helpers” of various forms to assist when needed. These can be tutors, but it is often very difficult for a student to find a tutor when they need one. Tutors are only available online at certain times, and these may not suit the other commitments of a particular student group. This is a particular problem when specific expertise is required and deadlines loom. The virtual environment is no different in that respect than the traditional academic department. Tutors also need to spend significant time monitoring groups and counseling those that are not functioning in various ways. Much of this can be done using agent technology, interacting with both the student and the learning environment (Whatley et al., 1999).

There is also a role for more mobile agents that can explore the world, reporting back on changes and useful material that would otherwise been overlooked. This gives many opportunities to develop complex relationships between students, tutors and the mobile agents that all populate the OTIS world. We then come to the issues of crowd control. Even within quite limited trials, students have reported being distracted by unintended interactions with other participants in some of the more central areas. This can be alleviated to a certain extent by dividing these areas more effectively, but as the number of OTIS students increase, will inevitably arise again. Social
protocols are again needed to ensure appropriate behavior in all areas.

Conclusions

Construction of the OTIS environment has entailed a considerable effort in many different areas. This has allowed us to develop a rich distance-learning environment that can support the learning requirements of a highly practical and widely dispersed group of students. The technical solutions have been developed, initially to meet the business requirements of the Internet school model, and more recently in response to the more specific requirements of the occupational therapy course as they have emerged through course development. The rapid lowering of cost of relatively high-speed Internet access to homes throughout Europe will provide many more opportunities to deliver courses such as this more effectively using a richer mix of multimedia materials. In the meantime, the more network intensive materials can be distributed separately on CD-ROMs, so that there are not unnecessary delays in delivery that would make collaboration very difficult. This can only be an interim solution as the immediacy of real-time presentation is lost.

The OTIS project shows that it is possible for students to undertake group learning using problem-based learning techniques when spread over different countries. The current OTIS pilot aims to show that this can be done with reasonably sized classes over the extended periods required for award bearing courses. The distributed nature of the student population means that all support has to be online, and if groups are to gain from the differing experiences across Europe, a high level of online interaction is required. It also shows that it is possible for students to undertake effective group learning across country boundaries, using the Internet to deliver both materials and tutorial support. Students who have undertaken the first course trials have shown evidence of the development of essential critical appraisal skills, and they have discovered effective ways of handling needs for help. The use of peer support via on-line “chats” has proved both popular and educationally productive as a student support mechanism.

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