International Journal of Innovation and Research in Educational Sciences
Volume 2, Issue 2, ISSN (Online): 2349–5219

# Changes in Medical Student's Perspective on Priorities in Undergraduate Education and Training Following Completion of Internship

**NM McInerney, JO Larkin, AP O'Callaghan, G Avalos, C Malone and MJ Kerin**
Department of Surgery, University College Hospital, Galway and National University of Ireland, Galway.
Corresponding Author email : nmac@ymail.com

*Abstract:*

***Introduction:*** **University faculties and departments are undergoing fundamental organisational and curricular restructuring. Undergraduate medical students commonly focus study practices towards the final medical examination rather than preparation for a clinical career. A disparity currently exists between theoretical knowledge and practical application, which is apparent at the start of the internship.**

***Aims:*** **The aims of this study were to identify what aspects of the curriculum could be improved in preparing medical students for clinical work and to assess if an increased emphasis on clinical and technical aspects of education such as shadowing and training in practical procedures would be appropriate.**

***Methods:*** **Comprehensive questionnaires were circulated to the intern class and the final medical class of 2006/07 in NUI Galway. Methods of teaching and emphasis on clinical aspects of training were among the topics students' perspectives were sought on. Attitudes to important aspects of the curriculum were compared.**

***Results:*** **40 interns and 74 final year medical students completed the questionnaire. While 74% of students thought emphasis on clinical attachments was appropriate in preparation for practice, 77% of interns thought it too little ($p<0.0001$). The vast majority of interns feel training for performing procedures is inadequate (85% IV cannulation and 75% phlebotomy). 74 % of students and 70% of interns found shadowing on call to be of benefit. The intern year caused 50% of interns to change their choice of career.**

***Conclusions:*** **Following completion of the intern year, a greater value is placed on the clinical aspects of undergraduate education. A majority of both students and interns felt that they were underprepared for the practical procedures. It is necessary to provide prospective interns with the clinical skills and practical experience to enable them to make this difficult transition from student to junior doctor as seamlessly as possible.**

***Keywords:*** **Medical Student's, Undergraduate Education, Training and Internship**

## I. INTRODUCTION

University faculties and departments are undergoing fundamental organisational and curricular restructuring. Central to this restructuring is the drive towards incorporating training in practical procedures and professional attitudes into curricula. Undergraduate medical students commonly focus study practices towards the final medical examination rather than preparation for a clinical career. The transition from student to junior doctor can be difficult, if the required knowledge and skills to adequately perform in the role are not obtained at undergraduate level (1). With appropriate preparation the transition to becoming a valuable member a healthcare team can be an enjoyable and fulfilling experience (2). Insights obtained during the practical experience of internship may be useful in redesigning the undergraduate curriculum.

A disparity currently exists between theoretical knowledge and practical application, which is most acutely apparent at the start of the internship. Acknowledgement of this has precipitated notable shifts in the approach to undergraduate education in many countries (3-5). It is imperative that this process is directed by clinicians to ensure that curricula are as clinically relevant as possible.

Techniques and opportunities for clinical exposure such as shadowing the on-call team or intern give students a valuable insight into how medical knowledge and practical experience in manual procedures can be integrated into clinical practice. Currently the majority of clinical attachments take place within two years of the final medical exam. As such, attention may be diverted from gaining clinical experience, relevant for a career in medicine, to exam focused study. For instance, the benefits of a dedicated period of shadowing the intern whom the student will succeed have been demonstrated allowing the student to commence their internship with confidence(6). This period of practical experience has been demonstrated to improve student's clinical aptitude and prepares them for the tasks which will be required throughout the intern year(7). A survey published in 2005 nonetheless revealed that 63% of Irish interns felt underprepared for the internship (8).

The most critical time in preparation for internship is the final medical year. In our university, students commencing the final medical year have just completed courses in paediatrics, psychiatry and obstetrics and gynaecology. The first two weeks are thus composed of revision lectures in medicine and surgery.

During the remainder of the first semester, students undertake two week attachments with selected medical and surgical teams, wherein they participate in the ward rounds, outpatient clinics, endoscopy and operating sessions and educational or multidisciplinary clinical meetings as applicable to the specific medical or surgical specialty. These attachments occur both at the university teaching hospital and the affiliated peripheral teaching hospitals. One week attachments in radiology and

anaesthesia are also undertaken at the university teaching hospital.

Throughout this period, weekly clinical lectures are given to the whole class, covering the entire surgical curriculum, while the major topics in the various surgical subspecialties are considered in small group teaching by each registrar on a weekly basis. Students are encouraged to participate in the on-call assessment and management of acute admissions when the team to which they are attached is on-call. In addition, two revision courses are arranged during the final year, broadly covering the theoretical and clinical aspects of the surgical curriculum. In the second semester students are attached as junior interns for four-week periods to medical and surgical teams, either at the university teaching hospital or one of the affiliated peripheral teaching hospitals, and may themselves choose a third elective internship.

## II. Aims

*The aims of this study were:*

1) to ascertain which aspects of the undergraduate medical curriculum could be improved in preparing medical students for clinical work by determining how attitudes toward the relative importance of aspects of the course change after practical exposure to clinical practice during internship.

2) to assess if an increased emphasis on clinical and technical aspects of education such as shadowing and training in manual procedures would be considered appropriate.

## III. Methods

Comprehensive questionnaires were circulated to the intern class and the final medical class of 2006/07 in the National University of Ireland, Galway at the end of the hospital year (June 2007). Questionnaires were circulated to final year students following completion of their exams. Interns were given the questionnaire following completion of nine months of internship, both directly if possible and by e-mail.

Interns' and students' perspectives were sought on a variety of topics relating to methods of teaching and assessing the emphasis placed on various clinical aspects of training. Attitudes to important aspects of the curriculum were compared between final year students and interns. The emphasis placed on clinical attachments both in preparation for practice and the final medical exam was assessed. Opinions with regard to the level of training in practical procedures were ascertained. The questionnaire assessed the amount of exposure both groups had to on call work and how beneficial they found this to be. It also examined the perception of both groups of the hours worked by interns in medicine and surgery, as well as their opinion regarding the European Working Time Directive (EWTD). Common teaching modalities and examination techniques were assessed with regard to the benefit they conferred and their fairness respectively. Interns' opinions regarding the level of structured education during the intern year and whether their career choice had changed during the year was also assessed.

SPSS version 15.0 was used to carry out descriptive statistics. The level of significance was set up at 0.05 and categorical variables were compared using Pearson's Chi-Square test.

## IV. Results

40 interns and 74 final year medical students completed the questionnaire.

With regard to the emphasis placed on clinical attachments we noted a significant difference between students and interns. While 74% of students thought emphasis on clinical attachments was appropriate in preparation for practice, 77% of interns thought it too little ($p<0.0001$). Similarly, 86% of students thought emphasis on clinical attachments was appropriate in preparation for the final med exam, but 44% of interns thought it too little ($p<0.0001$) (Figure 1).

Formal training in the practical procedures which constitute much of the ward workload of an intern were also assessed (Figure 2). These included intravenous (IV) cannulation, phlebotomy, urinary catheter (UC) insertion, nasogastric (NG) tube insertion, arterial blood gas (ABG) sampling and suturing. Students felt that they had received sufficient training with regard to IV cannulation and phlebotomy (93% and 82% respectively) however this contrasted with the attitude of interns (15% and 25% respectively) ($p<0.0001$). Although both students and interns felt training with regard to UC insertion, NG tube placement, ABG and suturing was inadequate, the interns thought it was even more lacking.

A majority of both students (97.3%) and interns (75%) had gone on call as a student. Of these, 74 % of students and 70% of interns found it to be of benefit.

Both interns (57.5%) and students (66.2%) felt that shadowing the intern before succeeding them in their post would be a valuable learning experience with a majority feeling it should be compulsory, 65.8% and 77.5% respectively. Interns themselves felt that this would be relevant preparation for the students (very relevant 45%, relevant 27.5%).

A difference was noted in the perception of the number of hours worked as an intern (Table 1). With regard to the medical and surgical internship, 70.5% and 92.5% of interns felt that these involved greater than 60 hours per week respectively compared with 31.2% and 62.5% of students. Only 37.5% of students believed surgical interns work >70 hours/week on average compared to 52.5% of interns. Interestingly the majority of both interns (69.2%) and students (53.2%) were in favour of the introduction of the EWTD which would limit the working week, including time on-call, to 48 hours.

Attitudes to teaching modalities were similar between the two groups (Table 1). Case presentation, bedside

tutorials, small group tutorials and peripheral hospital attachments were all judged to be very beneficial by both groups. Teaching ward rounds, computer based learning, attending operations in theatre and formal didactic lectures were regarded as beneficial by a minority.

The perception of the fairness of examination techniques, specifically, Multiple Choice Questions (MCQs), short answer questions, essay type questions, long cases, short cases, Objective Structured Clinical Examinations (OSCEs) and oral examinations was assessed (Figure 4). Short answer questions and cases, long cases and OSCE exams were deemed the fairest. A notable proportion of interns found MCQ and essay question forms of examination either very unfair or unfair (42.2% for MCQ and 39.3% for essays).

A majority of interns felt that there was adequate structured education provided during the intern year (76.9%) and a similar majority felt that it should be compulsory for interns to perform a role as educators during the year (71.8%).The intern year caused 50% of interns to change their choice of career.

## V. Discussion

This study demonstrates that following completion of the intern year, a greater value is placed on the clinical aspects of undergraduate education. Interns felt in retrospect that there had been insufficient exposure to clinical work while on attachments, both to equip them for clinical practice and in preparation for the final year exam, in contrast to the attitude of current students.

A majority of both students and interns felt that they were underprepared for the manual procedures which comprise a significant component of interns' wardwork. While a majority of students felt confident that they were adequately prepared with respect to phlebotomy and intravenous line insertion, the interns felt they had insufficient undergraduate experience of these techniques.

A clear preference for small group teaching, bed-side tutorials and presenting cases to a clinician was expressed by both students and interns. A majority of students felt that greater use should be made of computer based learning in the current curriculum; however this will undoubtedly be increasing in the near future. Computer based learning programmes has been positively correlated with improved results and will undoubtedly be increasingly incorporated into new curricula (9, 10).

This learning environment has to be carefully structured and continually monitored as significant variations in learning experience have been demonstrated (11). If education in clinical skills and training in practical procedures are delivered in an equal manner to all students in an enjoyable learning environment, then students will benefit from the development of the relevant knowledge, aptitudes and ability to work in a healthcare team atmosphere. The quality and quantity of supervision during attachments must also be maintained at a high standard as failure to do so has been shown to be harmful to the learning process (12).

Confidence when commencing the internship has been positively correlated with allowing final year students to engage in a self directed course which they tailor to their own specific needs (13). Although this association requires further evaluation our study demonstrates that both students and interns felt that there was too little self directed learning, 60.6% and 60.5% respectively (Figure 3).

The internship is one of the most crucial and formative years in any doctor's career. Its profound influence on a doctor's future is demonstrated clearly in that half of all interns surveyed changed their career choice by the year's end. The transition from student to intern is widely accepted to be a time of considerable physical and mental demands (14). It is therefore necessary to provide prospective interns with the clinical skills and practical experience to enable them to make this difficult transition as seamlessly as possible, both for the benefit of the newly qualified doctor and the patients they treat.

**Table 1.** Specific aspects of the undergraduate medical education programme deemed to be beneficial or non-beneficial by both Interns and Students (differences did not achieve statistical significance).

| Beneficial | Intern | Student | Non-Beneficial | Intern | Student |
|---|---|---|---|---|---|
| Presenting Cases to a Clinician | 92% | 92% | Ward Rounds | 65% | 28% |
| Bedside Tutorial | 95% | 96% | Computer Based Learning | 33% | 21% |
| Small Group Tutorial | 80% | 93% | Operating Theatre | 68% | 38% |
| Peripheral Hospital Attachment | 67% | 85% | Formal lectures | 22% | 18% |

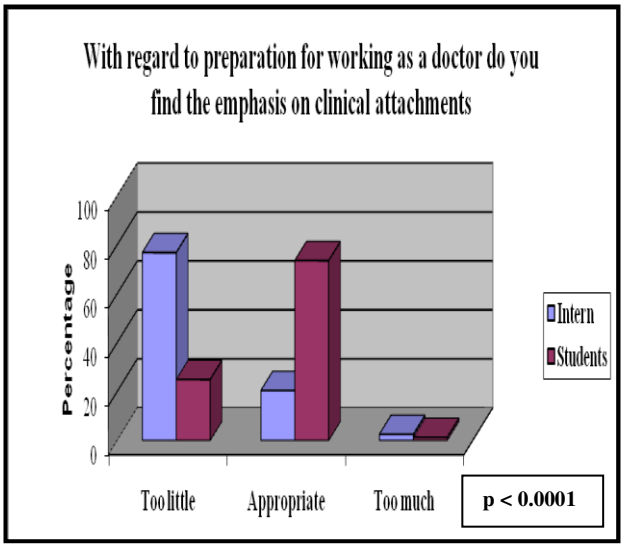


**Figure 1.** The difference of opinions regarding undergraduate clinical attachments between students prior to starting the internship and interns who have completed the intern year.

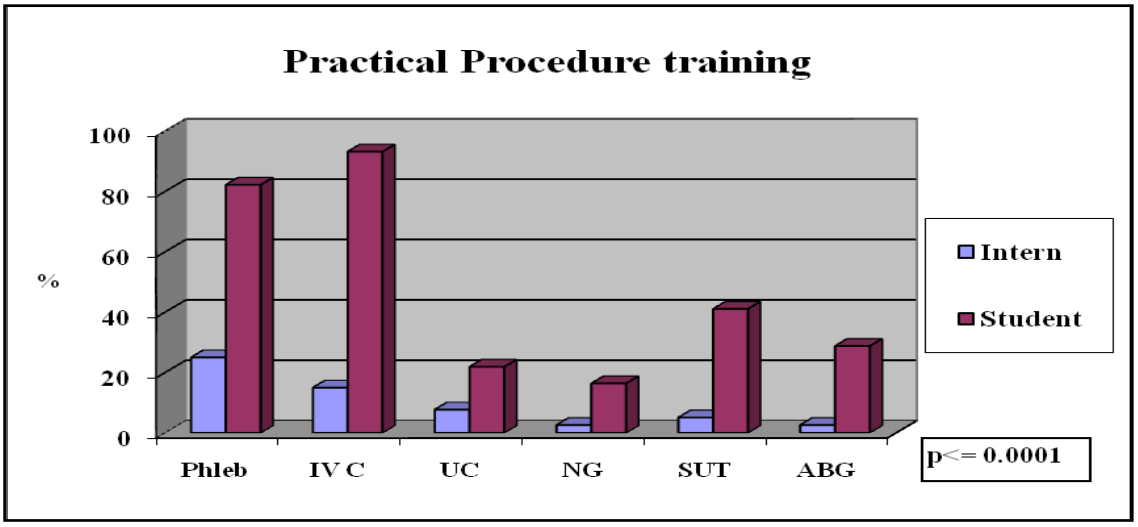


**Figure 2.** The difference of opinions regarding training in practical procedures between students prior to starting the internship and interns who have completed the intern year. The practical procedures assessed were phlebotomy, intravenous line insertion, urinary catheter insertion, nasogastric tube placement, suturing and arterial blood gas sampling. There was a significant difference between the groups with students feeling that they were well prepared, particularly in phlebotomy and intravenous cannulation.

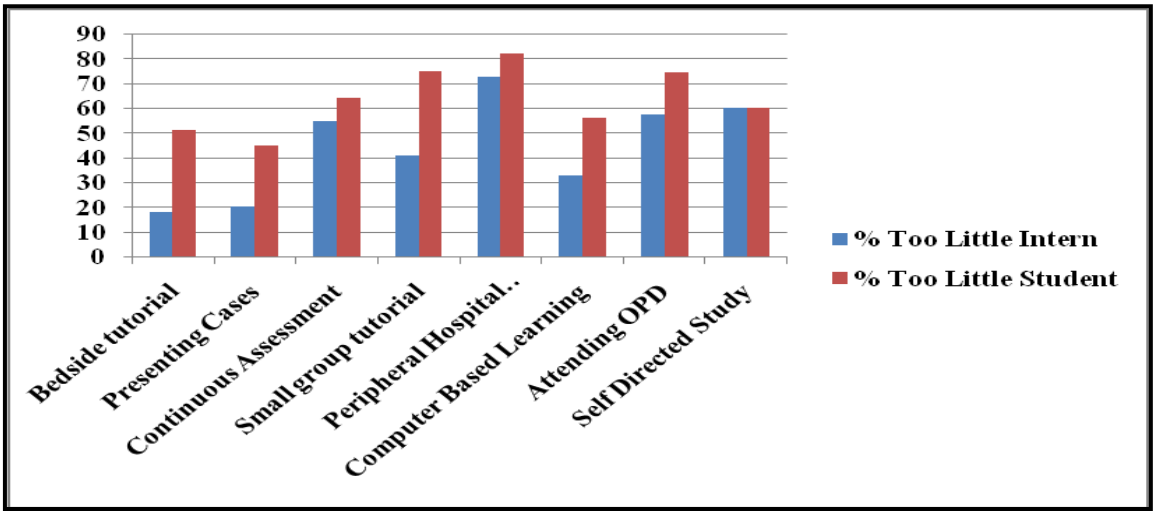


**Figure 3a** Aspects of medical teaching which students and interns felt should be given greater emphasis.

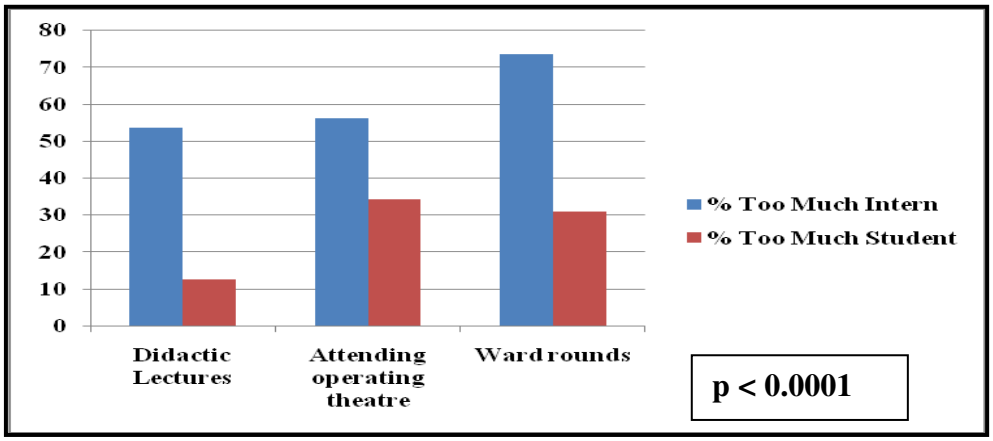


**Figure 3b** . Aspects of medical teaching which interns and students felt should be given less emphasis. A significant difference was noted with interns feeling that there was too much emphasis on didactic lectures, attending operating theatre and ward rounds ($p < 0.001$).

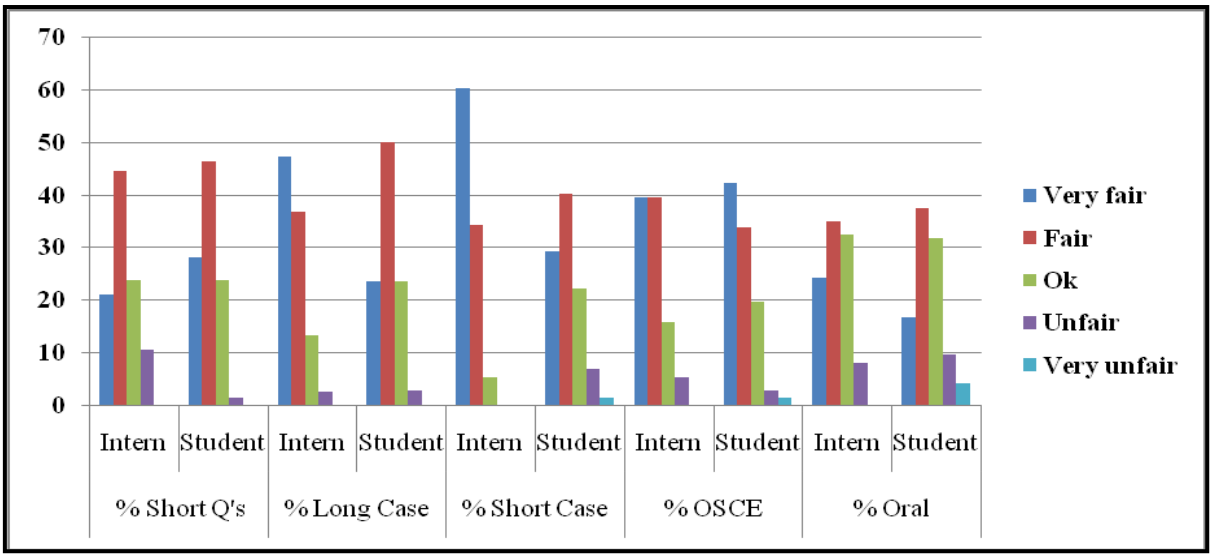


**Figure 4a** Students' and interns' assessment of the fairness of specific examination techniques used in medical education.

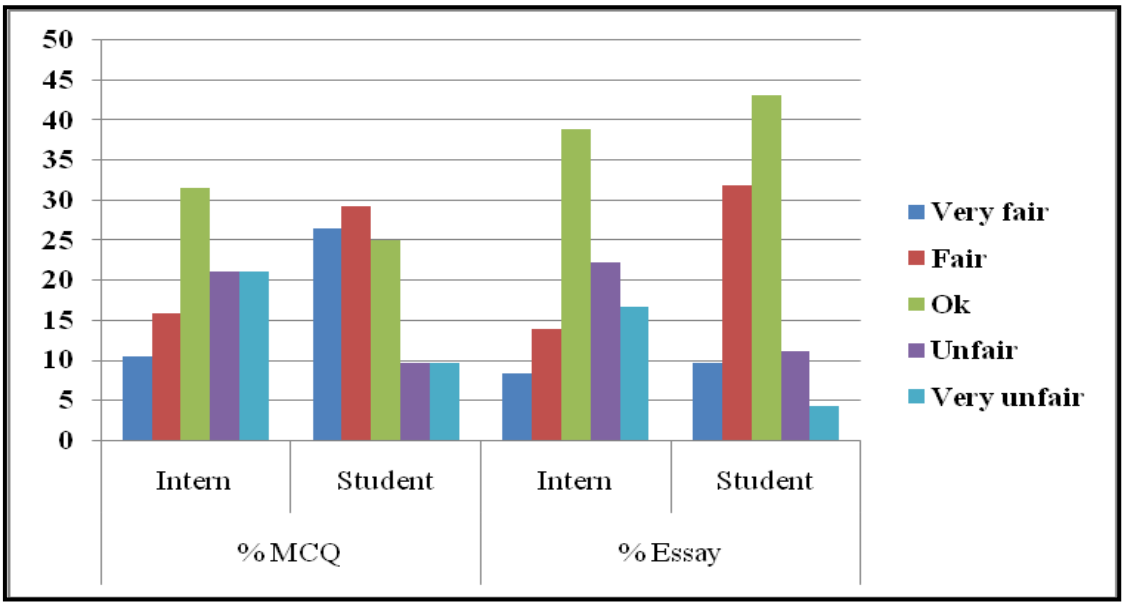


**Figure 4b** MCQ and essay type questions were deemed to be a less fair means of examination by both groups. 42.2% and 39.3% of interns found MCQ and essay questions respectively to be unfair or very unfair.

## REFERENCES

[1] Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. The impact of job stress and working conditions on mental health problems among junior house officers. A nationwide Norwegian prospective cohort study. Med Educ. 2000 May;34(5):374-84.

[2] Finset KB, Gude T, Hem E, Tyssen R, Ekeberg O, Vaglum P. Which young physicians are satisfied with their work? A prospective nationwide study in Norway. BMC Med Educ. 2005;5(1):19.

[3] Karle H. Global standards in medical education - an instrument in quality improvement. Med Educ. 2002 Jul;36(7):604-5.

[4] Simpson JG, Furnace J, Crosby J, Cumming AD, Evans PA, Friedman Ben David M, et al. The Scottish doctor--learning outcomes for the medical undergraduate in Scotland: a foundation for competent and reflective practitioners. Med Teach. 2002 Mar;24(2):136-43.

[5] O'Donnell JF. The Medical School Objectives Project (MSOP). J Cancer Educ. 1999 Spring;14(1):2-3.

[6] Jones A, Willis SC, McArdle PJ, O'Neill PA. Learning the house officer role: reflections on the value of shadowing a PRHO. Med Teach. 2006 May;28(3):291-3.

[7] Lempp H, Cochrane M, Seabrook M, Rees J. Impact of educational preparation on medical students in transition from final year to PRHO year: a qualitative evaluation of final-year training following the introduction of a new year 5 curriculum in a London medical school. Med Teach. 2004 May;26(3):276-8.

[8] Finucane P, O'Dowd T. Working and training as an intern: a national survey of Irish interns. Med Teach. 2005 Mar;27(2):107-13.

[9] Corrigan M, Reardon M, Shields C, Redmond H. "SURGENT" -- student e-learning for reality: the application of interactive visual images to problem-based learning in undergraduate surgery. J Surg Educ. 2008 Mar-Apr;65(2):120-5.

[10] Healy DG, Fleming FJ, Gilhooley D, Felle P, Wood AE, Gorey T, et al. Electronic learning can facilitate student performance in undergraduate surgical education: a prospective observational study. BMC Med Educ. 2005;5:23.

[11] Daelmans HE, Hoogenboom RJ, Donker AJ, Scherpbier AJ, Stehouwer CD, van der Vleuten CP. Effectiveness of clinical rotations as a learning environment for achieving competences. Med Teach. 2004 Jun;26(4):305-12.
[12] Wimmers PF, Schmidt HG, Splinter TA. Influence of clerkship experiences on clinical competence. Med Educ. 2006 May;40(5):450-8.
[13] Whitehouse CR, O'Neill P, Dornan T. Building confidence for work as house officers: student experience in the final year of a new problem-based curriculum. Med Educ. 2002 Aug;36(8):718-27.
[14] Tyssen R, Vaglum P, Gronvold NT, Ekeberg O. The relative importance of individual and organizational factors for the prevention of job stress during internship: a nationwide and prospective study. Med Teach. 2005 Dec;27(8):726-31

## AUTHOR'S PROFILE

**Mr Niall McInerney**
is a Plastic Surgical Specialist Registrar working in Galway University Hospital in Ireland. His specialist areas of interest are hand and microsurgical reconstruction, as well as Medical Education.

**Mr John Larkin**
Consultant General Surgeon, St James Hospital, Dublin

**Mr Adrian O'Callaghan**
Consultant Vascular Surgeon, St James Hospital, Dublin

**Ms Gloria Avalos**
Lecturer in Medical Informatics, National University of Ireland, Galway

**Ms Carmel Malone**
Consultant Breast and General Surgeon Galway University Hospital and Lecturer in Surgery, Galway University Hospital and National University of Ireland, Galway

**Prof. Michael J Kerin**
Consultant Breast and General Surgeon Galway University Hospital and Professor of Surgery, Galway University Hospital and National University of Ireland, Galway