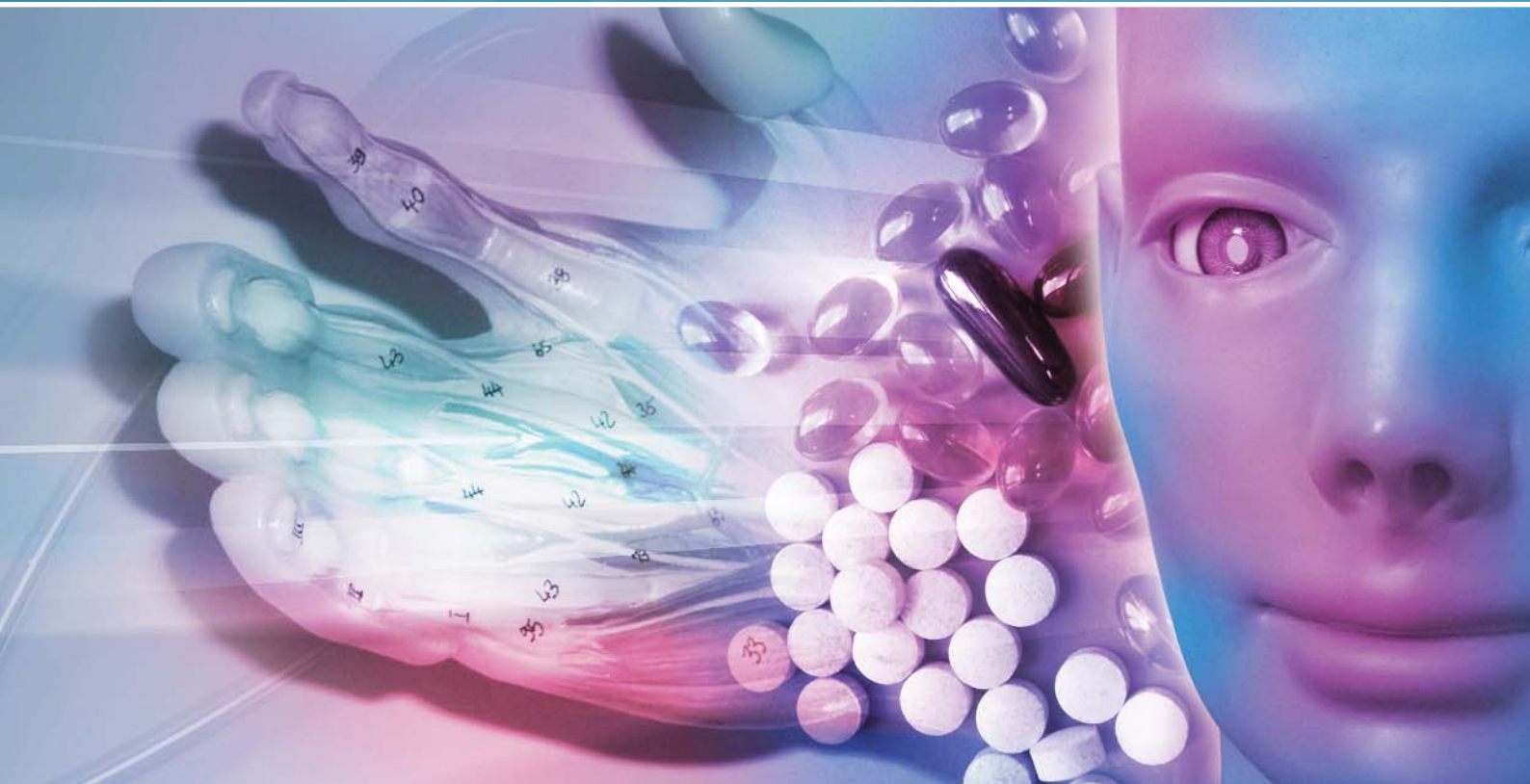




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# INTERNATIONAL JOURNAL OF CLINICAL SKILLS



**A Peer Reviewed International Journal for the Advancement of Clinical Skills**  
– *'docendo ac discendo' – 'by teaching and learning'*



## **C.O.M.E.T. – A novel educational method in clinical skills**

From simulation to reality

Shibboleths of incompetence

Development of a clinical skills bus: making simulation mobile

"See one, do one, teach one!" – the uphill struggle for clinical skills acquisition

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The International Journal of Clinical Skills looks forward to contributing positively towards the training of all members of the healthcare profession.

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# Mission Statement

The clinical skills arena is an ever expanding field with an increasing wealth of knowledge; however there is no central resource for the sharing of evidence based research and information. The International Journal of Clinical Skills (IJOCS) is a peer reviewed International Journal, which will promote the sharing of information and evidence based research, as well as bringing together the clinical skills community.

The Journal aims to develop and maintain standards in research and practice, lay a platform for discussion and debate, and provide opportunity to present evidence based medicine and critical appraisal of research. Provision of this much needed resource for both students, teachers and healthcare professionals, will ultimately enhance patient care.

The IJOCS will be a regular publication, three times a year in the first instance, both online and in print. The implementation of the IJOCS website will provide a continual resource for daily use. Also, in conjunction with the 'Clinical Skills Lab', the IJOCS will allow access to an online database on over 200 clinical skills – launching in 2008.

A diverse range of reviewers support the Editorial Board, all of whom are leaders in their respective fields and the IJOCS prides itself on the quality of content. Contribution of original ideas, research, audit, policy, reviews, case reports and 'Letters to the Editor' are welcome from all those involved in this multidisciplinary field. Submissions are not limited to these specific publication types and your novel suggestions will be considered.

I wish to thank all those involved in the development of this unique venture – a Journal whose remit is highly significant to today's needs.

**Dr Humayun Ayub**

Editor-in-Chief

International Journal of Clinical Skills

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# Foreword

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## **International Journal of Clinical Skills** – An exciting forum for clinical skills

There has been an explosion in the volume of medical information related to clinical skills, which are essential in our efforts to maintain optimal patient care. The International Journal of Clinical Skills (IJOCS) aims to disseminate this knowledge in an easily accessible form. This will not only enhance our attempts to provide a quality health service, possibly with some standardisation, but also provide a vehicle for teaching and learning, hence the Journal's motto – 'docendo ac discendo' (by teaching and by learning).

The IJOCS will not only serve as an avenue for publication of research papers, but will also act as a means of communication between clinical skills professionals at an international level. Consequently, those involved in the clinical skills field, can keep those in other countries informed of their activities, as well as offering best practice guidance.

Alongside this valuable publication, a continually evolving online database ('Clinical Skills Lab') will become available for students and teachers to access – this will hold extensive information on over 200 clinical skills. The Clinical Skills Lab will be regularly updated by all those involved in this field and provide a platform for discussion and debate.

The IJOCS also aims to present comment on items of specialist interest. For example, the current issue contains a paper by Professor Harold Ellis CBE, on 'Medico-legal consequences in surgery due to inadequate training in anatomy', and explores the potential niche for anatomical clinical skills training within the newly developed medical Foundation Years (F1 & F2). It is hoped readers will make use of the Journal to comment on matters such as this – and on others relating to the subject of clinical skills – by means of 'Letters to the Editor', research based evidence and shared practice.

In order for IJOCS to become an exciting forum for clinical skills, the Journal welcomes submission of innovative research, papers, reviews and case reports. Of course, submissions are not only limited to these specific publication types and your innovative ideas would be greatly welcome by the Editor.

I am confident that IJOCS will be appreciated by a variety of health care professionals, at an international level. It promises to be representative of an ever expanding field, and with the support of all those able to contribute, it will, without doubt become increasingly influential.

I wish those responsible for the production of the International Journal of Clinical Skills, the success which their initiative deserves.



**Professor The Lord McColl of Dulwich CBE**  
September 2007



# Development of a clinical skills bus: making simulation mobile

---

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**KEYWORDS:**

Clinical skills  
Bus  
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Skills centre

## Introduction

The Clinical Skills Centre at St Bartholomew's Hospital was opened in 1994 and was the first of its kind in the UK. It is jointly managed by the School of Nursing & Midwifery at City University London and the School of Medicine & Dentistry at Queen Mary, University of London. The size of the Skills Centre was adequate when it first opened but the steady growth in numbers in both schools and the increased emphasis on clinical skills in both curricula meant that it was soon too small. There was no possibility to expand the Skills Centre sideways and the foundations would not allow us to expand upwards; an additional floor had already had been added when the Clinical Skills Centre was built. Furthermore, both universities have distributed campuses, and students in hospitals, health centres, care homes and surgeries across East London and beyond, when on clinical placements.

It was agreed that we needed to expand the Clinical Skills Centre to accommodate more students, but we also needed to consider other ways to meet the needs of our students when they were not in the university. That was when the idea of a Clinical Skills Bus was born. The award of Centre for Excellence in Teaching and Learning (CETL) status by the Higher Education Funding Council for England (HEFCE) in 2005 gave us the opportunity to do both. The role of simulation in the development of clinical and communication skills has been discussed elsewhere (see for example Alinier et al, 2006; Kneebone et al, 2004; Maran & Glavin, 2003) and will not be addressed here. The paper will discuss our experience of purchasing a suitable vehicle, converting it into a mobile learning facility, appointing a driver, and other issues to consider.

## Purchasing the vehicle

When deciding to develop a mobile learning facility you will be faced with a choice of different types of vehicle. Lorries and trucks have been successfully converted by some but we considered only buses and coaches due to the advantages of built in accessibility, pre-existing insulation properties (sound and temperature) and in many cases, double glazed windows.

### Buses

Second-hand double-decker buses can be purchased reasonably cheaply and having two decks seemed ideal to provide maximum teaching space. However, further inspection revealed headroom on the upper deck was limited throughout, especially at the sides of the bus, and the staircase intrudes, thus reducing the available floor space. The lower deck has intrusion from the wheel arches, which makes it a good area for seated activities, although the number of possible arrangements is limited, but less good for activities that require floor space. The staircase also intrudes into the lower deck and further reduces the available floor space.

There is a good deal of noise from the upper deck when chairs are being moved around and people are walking around. Storage space is limited and will need to be built into the interior, which can reduce the space available for teaching and learning. The height of the bus may limit access to some locations. Single-decker buses tend to be more spacious in terms of headroom but have the same problems with wheel arch intrusion and storage space. For these reasons we chose a coach.

### Coaches

Coaches come in all shapes and sizes and have a number of advantages over single and double-decker buses. Headroom in most coaches is 6ft 1in in the centre and once the overhead luggage storage areas are removed,

## Abstract

The Clinical Skills Bus was developed in order to meet the needs of healthcare students in distributed two university campuses, and also when working in clinical placements that are often geographically distant from the Skills Centre. It was developed as part of the Centre for Excellence in Teaching & Learning (CETL): Clinical and Communication Skills funded by HEFCE. This paper describes the various stages of development: choosing the vehicle and converter, writing the invitation to tender, design issues to consider and recruiting the driver/facilitator.

only slightly reduced at the sides. There is no wheel arch intrusion but you do need to select a coach that does not have a sloping floor or sunken gangway, as this will mean reduced headroom when the floor is filled to provide a flat floor. Large, lockable, under-floor lockers provide secure storage for chairs, couches, screens, models and simulators and other equipment and most have sky lights which provide additional light and ventilation when the weather is fine. Many will have a toilet compartment but this can be removed during the conversion process or converted into further storage.

#### Manual or automatic

Consider where the vehicle will be driven. If driving in large towns or cities is likely then an automatic transmission will make it much easier. Also, the person recruited to drive the vehicle may not have previous experience of driving coaches and is likely to find automatic transmission much easier.

#### Running costs to consider

Once up and running you will need to allow for the costs of diesel, road tax, MOT, servicing, insurance and, if ever in London, the Low Emission Zone charge (from 2008) and congestion charge. Your university insurance officer will be able to arrange the insurance; check that the vehicle is covered by the converter's insurance policy whilst on their property. We have budgeted £13K per annum for running costs and thus far this seems about right.

## Finding the right vehicle

Trade journals (these are usually free to any university that has buses, minibuses or vans) and web sites will give you an idea of what is available at what price. You will need advice from someone who understands, and ideally is able to drive, a large vehicle. It is worth emailing everyone in your organisation to see if there are any with bus industry experience who can help. We were extremely lucky to find such a person in our purchasing department! It is also important that someone who is familiar with the type of teaching that will take place in the Skills Bus is involved in selecting the vehicle because he or she will know how much floor space and storage space will be needed. An assessment form was created to ensure nothing was overlooked and allow comparison between vehicles (see Appendix 1). Having identified the type of vehicle we were likely to purchase we then began the tendering process for the conversion. This was so that a physical location for the coach would be available when we purchased the vehicle.

When you locate a suitable vehicle that meets your specification you may have to move quickly to secure it. This is not always easy in a university and so it is a good idea to talk to your purchasing and finance department



as early as possible. With notice they should be able to issue a purchasing card or raise a cheque for the deposit to secure the vehicle whilst you have it inspected and sort out the rest of the payment. It is well worth having these discussions before you start looking, so that when you find the right vehicle which has everything, you can move quickly. We budgeted approximately £35K for the vehicle but were prepared to go to £60K for a vehicle in excellent condition. The total budget for the project was £130K and it was felt that a vehicle in excellent condition would result in savings elsewhere. In the end the coach we chose cost £30K plus VAT.

## Converting the bus or coach

The internet and trade journals were used to locate bus conversion companies and it is worth visiting a few before completing your 'invitation to tender'. You will learn a lot by discussing what you want with several companies and will inevitably identify some issues that you had not previously considered. This allows you to develop a detailed specification for the work required before inviting companies to tender for the business. You may wish to purchase the vehicle independently (as we did) or include sourcing a suitable vehicle as part of the tender. Independent purchasing of the vehicle is more time consuming, but this does give you more control and also allows you to change your mind about the type of vehicle.

If possible, choose a converter who is not too far away as you will probably need to visit at least three times during the process and maybe more. If they are reasonably close, it will also be easier to resolve the inevitable 'teething' problems that occur when you take delivery of the vehicle. It is important to choose a company with a proven track record of conversion of a variety of vehicles.

#### Writing the 'invitation to tender'

When writing the invitation to tender for the conversion you will need to list the features that you require such as: hand washing facilities, the number of electrical sockets, heating and cooling systems, the type of flooring, the level of lighting required and the type of fixed tables and seating. You will also need to be thinking about the design of the exterior and whether you require vinyls to decorate the exterior. The company should be very knowledgeable and will be able to provide advice and suggestions on every aspect. The most important thing is to be clear about what you want to do with the bus and the type of teaching that will take place in it. It is a good idea to include a power hook-up in the specification so that the vehicle can be connected to the mains electrical supply when it is available. You also need to consider disabled access; we overcame this by purchasing a hydraulic wheelchair that can 'walk' up specially adapted steps on the other side of the vehicle. In our coach this doubles as an alternative entrance if the usual door is not alongside the kerb and an additional exit in the event of fire.

#### Choosing your converter

Your university policy will dictate the process involved and this usually requires getting a minimum of 3 bids for comparison and selecting the one that represents best value for money. If one company provides a bid that is significantly higher than the others it is worth having some discussion with them; they may have very good reasons for choosing better quality furnishings that will withstand the demands of regular use. It may be better to reduce the specification to stay within budget rather than use poor quality materials that soon start to look shabby.

## The CETL Clinical Skills Bus

We chose an a 12 metre Volvo Van Hool Alizee with automatic transmission registered in 1990; it was built for Hong Kong Citybus and had recently been brought back from there by the UK dealer. The body work, under floor storage areas and interior were all in very good condition and the coach appeared to have done much less work than could be expected of a coach of this age in the UK.

The CETL Clinical Skills Bus provides a mobile teaching space that is suitable for teaching most skills; in fact all except those that require a bed. Folding couches and portable screens are used to simulate a clinic setting



and hand washing facilities are available. Students can learn most skills from physical assessment and clinical observations to venepuncture and interpretation of X-rays. Equipment such as sphygmomanometers, resuscitation manikins and cannulation arms are used so frequently that these remain on the vehicle but most other equipment is taken from the Skills Centre as and when it is needed. This reduces the need for the purchase of additional expensive equipment.

The interior of the clinical skills bus is designed to be as flexible as possible with maximum floor space for skills such as resuscitation. Folding chairs and fold-down work benches along each side of the vehicle means that there is ample space for 12 students and one or two lecturers plus the driver/facilitator. Hand-held video recorders, which record directly onto a DVD, are available to enable students to review their performance. The space is equally suitable for communication skills. The chairs can be arranged in small groups with screens between to provide privacy. It is suitable for 10-12 students at a time and has a large bank of batteries and an inboard generator so that it can operate without access to an electrical supply. A ring main provides sockets throughout the vehicle for electrical equipment (e.g. IV pumps, blood pressure machines and ECG recording) as well as a data projector and lap top computer. For more information please visit [www.cetl.org.uk](http://www.cetl.org.uk).



## Driver/facilitator

As all those involved with clinical skills teaching know, the staff are your most important asset; this is equally true with the clinical skills bus. The driver/facilitator is an ex-paramedic whose job includes cleaning and maintaining the vehicle, stocking and equipping the bus for teaching, and teaching skills such as resuscitation, cannulation and first aid. When the bus is used for skills that he is unable to teach he provides support for the lecturer and when it is not required for teaching activity he can supervise students using it for self-directed practice. As discussed below, the driver manages all the bookings and promotion of the bus and so it is important to appoint someone with excellent interpersonal skills.

### Bookings and parking

The Driver/Facilitator manages the bookings and visits new locations in advance to determine the most suitable parking space. This is done in conjunction with the person booking the clinical skills bus as local knowledge and influence usually helps the negotiations. If the surgery or hospital does not have sufficient space available the local supermarket may be happy to help. If there is a suitable road with a single yellow line nearby, and parking there would not cause an obstruction, it is worth contacting the local council to request a permit to allow you to park there. One of the real challenges for us, being based in central London, was to find an overnight parking space, as the changes to the access approach made it impossible to use the space initially allocated. The ideal site is somewhere close to the Skills Centre, with access to mains electricity and a water tap – amazingly we found just such a place!

### Evaluation

The clinical skills bus has been extremely well received, even by the sceptics who have been surprised by the space available and the clinical 'feel' of the environment. Thus far it has been used by GPs, district nurses, qualified hospital staff and medical and nursing students in a variety of placements who wish to develop new skills and/or prepare for OSCEs.

Those using the clinical skills bus comment that it provides a pleasant environment that feels less formal than the university skills labs. In addition, the bus makes it easier to have access to specialist doctors and nurses, as they do not need to travel to the university - which may be a considerable distance away. The bus is distinctive and as such, it attracts attention and promotes clinical and communication skills, as well as the two universities. Most students comment that it is convenient, the equipment provided is excellent, the location is good, and it has helped them to prepare for exams.

Those teaching on the bus are equally positive and comment that teaching on the bus creates a different learning environment and a 'truly unique learning experience'. Others comment that with its state of the art equipment it is an excellent venue. The fact that the Clinical Skills Bus comes to them is a 'novel' idea that is much appreciated, especially as they do not have a training room in their trust. The Clinical Skills Bus has also proved to be a popular attraction at recruitment events and career fairs.

## Conclusion

Developing the Clinical Skills Bus has been an interesting, if time consuming, experience that has increased my knowledge of buses and coaches by 400%! The responses from those booking it demonstrate that a mobile skills lab is a useful and valued facility. The choice of vehicle and converter and the appointment of the right person as driver/facilitator are critical to a successful outcome. Of equal importance is having access to

the right level of expertise. Our heartfelt thanks go to Angus Warren, Commercial Director at City University London, whose time, wisdom, and knowledge were absolutely invaluable. ■

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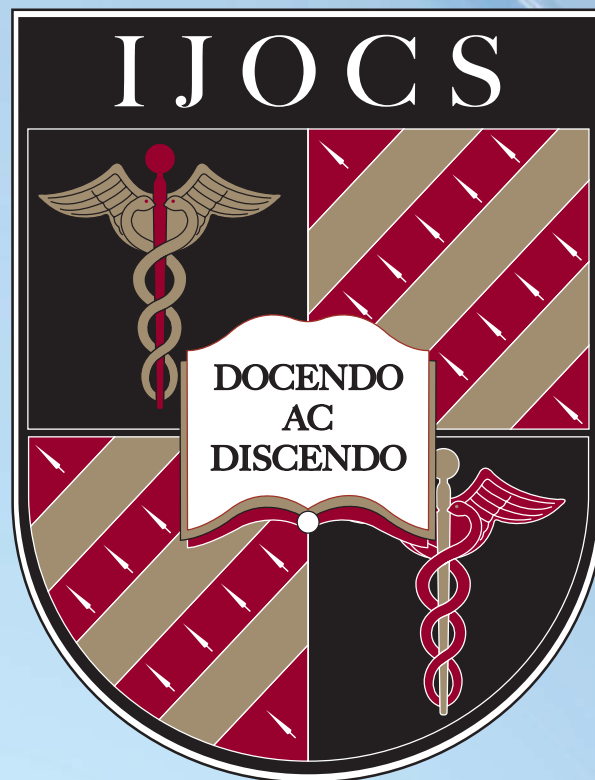
## Appendix 1 - Vehicle Assessment Form

Dealer Name & Location Contact details	
Vehicle Reg:	Year of First Reg:
Chassis:	Gearbox:
Body:	Length:
Interior Height:	Exterior Height:
Asking Price £	
Bodywork Condition Including glass	Front: OS: NS: Rear (?window): Roof (if visible): Door type & operation:
Interior Condition current trim?	Dash: Headlining: Sides: Flat floor: Convertability (racks /intrusions):
Tyres – Condition and Ownership	
Gearbox / Clutch operation	
Engine general - sound etc	
Electrics / controls	
Wheelchair/ Disabled access Options	
General Condition	
Comments	



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# Clinical Skills Lab (CSL)

The Clinical Skills Lab database will comprise information on over 200 clinical skills, broadly separated into:

- History taking skills
- Communication skills
- Clinical examination/interpretation skills
- Practical skills

Not only will this valuable resource provide material to students as a learning tool and revision aid, for example, OSCEs, it will also offer educational materials for teachers from all disciplines, allowing some standardisation of practice. The Clinical Skills community will also be encouraged to contribute, making this database interactive.

CSL is Launching in April 2008 – view sample material at **[www.ijocs.org](http://www.ijocs.org)** and take advantage of a 50% discounted rate if booked prior to **1<sup>st</sup> March 2008** (enter promotional code **CSL63R** at registration)