Continuing education: Management games – A Scottish experience

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Synopsis
Continuing education throughout their careers is becoming an increasingly important requirement for civil engineers. However, who will provide this ‘education’ and what will they provide? This paper describes the author’s recent experience at Paisley College of Technology, Scotland, in connection with the development of a college-based training unit called Construction Education-Macdata. One short course in particular is discussed.

The benefits of game playing and learning by doing in the development of construction management techniques are highlighted by the discussion of a game based on a mock negotiation meeting. The game is part of a two-day short course entitled ‘Negotiation Skills’ and is designed for project managers and senior engineers. Use is made of TV video-taping for playback and analysis of the various negotiating styles.

Introduction
In a recent report¹ on an international investigation of university education in civil engineering it was concluded that not only should continuing education be part of the postgraduate training programme leading to PEng status in South Africa, but professional engineers should undertake continuing education throughout their careers, as is the case in the UK²-⁴.

It could be argued that such is the rate of change in civil engineering that the knowledge of the present first-year undergraduate population will be out of date at their own graduation. The need for continual updating and familiarization with new developments is such that complete retraining at least once during their working life will soon be the norm for all professional civil engineers.

Continuing education providers
There have recently been radical changes in the funding arrangements for universities and colleges in the UK. Consequently, the high profile provision of continuing education on a full cost recovery basis has been adopted as appropriate for these establishments. Courses are provided in many formats, eg distance learning, in-house, in-company, in-school, etc.

At Paisley College of Technology, Construction Education-Macdata was formally established in July 1986 to provide a co-ordinated response to requests for the provision of training and education for the construction industry in the UK and elsewhere. ‘Learning by doing’ is the approach adopted on many of the courses and tutorials and game playing are regular features.

Negotiation skills
Construction Education-Macdata offers a short course in negotiation skills that is usually presented over two consecutive days, subdivided into sessions.

Session 1: Negotiation and communication
The context of interpersonal skills and the essential difference between construction and manufacturing are considered.

Session 2: Communication on paper
The importance of concise, precise and clear presentation of written material based on the appropriate use of words, numbers and diagrams is discussed.

Session 3: Opportunities for negotiation
Where does negotiation take place in construction? Negotiation within and between organizations is discussed.

Session 4: Presentation skills as part of negotiation
Targeting the audience, voice style, body language, aims and objectives, scripts, oral and visual presentations, and planning are all considered.

Session 5: The negotiation meeting
This is a major component of the course and is a mock negotiation meeting with delegates role-playing. The meeting takes place in the college media centre TV studio, which is set up as an office or boardroom. The entire proceedings are discreetly video-recorded for later playback and scrutiny.

The negotiation is concerned with changes to a two-storey reinforced concrete industrial building during the construction period. At an advanced stage of construction the client has a change of mind regarding the warehouse area and as a result the consulting engineer redesigns that part of the structure in structural steelwork, which is a more appropriate material. Unfortunately, by the time the main contractor is notified of this change, the foundations in the warehouse area have already been cast. However, no work has been completed above ground level. Fully detailed drawings and a bill of quantities for the new work have been produced by the consulting engineer and the client has stated that he wishes the design change to be made, but he cannot accept a delay of more than two weeks in contract completion and he is not prepared to pay additional costs of more than R12 000. Hence the negotiation meeting between the consulting engineer, the client, the main contractor and a steelwork subcontractor. As the contract has already been accepted by all parties as being two weeks behind schedule, the meeting must conclude an agreement on price and timing.

For the purposes of the game each delegate is assigned the role of engineer, client, main contractor or subcontractor and then provided with a copy of the new drawings and bill and a confidential written brief outlining his organization’s view of the situation and his ‘bottom line’. Below are the confidential briefs to the various parties.

Brief to main contractor: The original priced bill and the new bill are already in your possession. You are also given a copy of your estimator’s build-up showing his cost estimate.

Whilst it is agreed that the contract is two weeks late, your own estimate is that the true position is close to being four to six weeks late, with no cause that could be used as a basis of claiming an extension.

The opportunity of changing the design is attractive to you because:

- It would give you a reason to extend the contract time.
- The change to structural steel might actually save you time.
- You feel the original bill rates are already tight and you would not be sorry to delete some of the original work.
- You have had considerable trouble with steel fixing on the site.
- You know the steelwork subcontractor well and are sure you can rely on him to not let you down on time.

The drawbacks are:
• The cutting of pockets in the concrete bases for the steel holding-down bolts will be messy and expensive.
• You already have suitable formwork for the reinforced concrete work. However, the forms to encase the steelwork will have to be specially made.
• The margin on structural steelwork is nominal.

_Brief to the consulting engineer:_ As the consulting engineer you are really at the heart of this negotiation and should take the lead. As a professional your interest is to get the project completed in accordance with the client’s wishes, using good practice with regard to standards, design, etc., and on schedule.

You are concerned that the change may give the main contractor an excuse for delay, but knowing that steelwork is faster than reinforced concrete this should not be a problem.

An option for you would be to persuade the client not to make the change and accept the subsequent problems with his plant and machinery. However, he is a valued client for whom you wish to do further work. Your primary objective is to get the change accepted at an agreed price and time. The price itself is of little concern to your organization, but you must keep the client’s interests in mind.

You should also keep in mind the contractor’s interests as you are the intermediary. Timing is more important to you, because if the project runs late you may be accused of mismanagement.

_Brief to the client:_ The proposed change is important to you because of particular details of your new machinery and plant in the warehouse. However, you are conscious of the importance of completion on time and this factor is paramount. You have publicly stated that a two week delay is the maximum acceptable on the contract. In practice this is very important for the warehouse section, but less so in the offices. Your statement of a R12 000 ceiling on extra costs is not absolute and you have the flexibility to negotiate this. Your company would require you to seek higher authority to go above R30 000 in additional costs.

_Brief to the subcontractor:_ You have been brought into this project at a late stage and your company has quoted a reasonable price for the steelwork involved. This is a small order for your company, who are somewhat indifferent about getting the job, consequently you are quite infl exible about price. Your only room to negotiate is in the speed of construction; normally such an order would require a lead time of four weeks prior to fabrication commencing in your shop, followed by two weeks for fabrication and delivery and a further week for erection. You would have quite a struggle to persuade the fabrication shop to accelerate this timing.

You are personally fairly keen to get this work and also want to appear to all other parties to be helpful in anticipation of further work to come later.

The delegates are allowed a period of time to familiarize themselves with their brief, the new drawings and the documentation. This is followed by the negotiation meeting, which is limited to two hours’ duration, by which time a settlement must have been reached. The briefs are constructed such that everybody must negotiate. All parties, other than the subcontractor, who has his own reasons for wanting to do the work, have invested too heavily to simply walk away from the project.

_Session 6: Critical review of the negotiation meeting_

The object of the game is to demonstrate the various negotiation techniques adopted by the participants, with the specific aim of improving these techniques by viewing the meeting on edited playback video. What becomes immediately obvious is that the way a statement is made matters just as much as the actual substance of the statement. It is seldom that the most aggressive presentation wins an argument. Body language, voice control and style of presentation are all extremely important. An ability to communicate effectively is a substantial asset.

The actual details of the final agreement reached are less important than the route taken to reach this agreement and appreciating why the discussions took a particular course can be very informative. Under the gaze of company senior management in the TV studio control room, the game quickly becomes a ‘for real’ situation and a time limit usually has to be introduced to draw the discussions to a close.

Without the use of video and hence the ability to play back and scrutinize the meeting, the game would be of only limited value. However, with a video facility the results are startling. It should be understood that the video recording must be done discreetly to avoid presentations to camera.

The two-day course was initially designed specifically for a major UK contracting organization and given to a group of 20 of their contracts managers and senior site agents. They were divided into groups of four for the negotiation meetings, which took place simultaneously and in which each group was allocated a specially lit area of the otherwise darkened TV studio. Hence the studio was divided into five meeting areas and the cameras moved between each area as instructed by the producer using the usual headphone system to each of two cameras. To reduce sound interference between the groups baffle boards were placed between each group. Although sound did travel between the various areas, the overall effect was that of a meeting taking place in a core room of a poorly sound-insulated office.

In order to give a balanced analysis, the video tape must be edited to prevent one participant dominating the event. If possible, good and bad points demonstrated by all participants should be discussed. Consequently it is not necessary to replay the tape in the correct sequence, since it may be useful to show several examples of similar characteristics, eg particularly strident statements that produce totally non-productive responses.

It is worth noting that at the course design stage the negotiation meeting game was expected to be a bit of light relief to an otherwise heavy two-day schedule. However, it turned out to be the most demanding part of the course.

_Consulting Engineers_

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