

A BENCH DESIGNED FOR ALL ASPECTS OF TEAMWORK IN CDIO PROGRAMMES

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ABSTRACT

Learning spaces designed for teamwork and active learning in CDIO-based engineering programmes need to be equipped with appropriate furniture. Spaces such as the new Active Learning Lab at the University of Liverpool have been designed to be flexible and to be re-configurable to suit widely different student activities. The specification for the furniture for this space therefore contained the following requirements:

- Nothing to be fixed to the floor, giving the potential for a single open space;
- Benches to accommodate teams of up to six students;
- Benches to be movable by one person, and to be capable of being linked to form a stage;
- Seating to be integral with the bench, so that when the benches are stored or configured as a stage no additional storage is required for seating;
- Maximum lockable storage available within the volume of the bench;
- No permanent projection above the flat upper bench surface;
- Power and data available on each bench via a single umbilical supply;

No ready-made solution meeting these criteria could be found from a commercial supplier so a custom solution was designed and 50 benches were commissioned. The design solution is presented in this poster.

INTRODUCTION

Learning spaces designed for teamwork and active learning in CDIO-based engineering programmes need to be equipped with appropriate furniture. Spaces such as the new Active Learning Lab (ALL) at the University of Liverpool have been designed to be flexible and to be re-configurable to suit widely different student activities. The ALL must accommodate 250 students working in teams of 5 or 6 who, on any particular day, might be engaged in any aspect of the CDIO range of activities. The space must be usable for team meetings, conceptual design, detailed engineering design, assembly and aspects of manufacturing, and ultimate testing and operation of products. The specification for the furniture for this space therefore contained the following requirements:

- Nothing to be fixed to the floor, giving the potential for each ALL to become a single open space;
- Benches to accommodate teams of up to six students, and to be robust enough for mechanical, electrical and civil engineering work;
- Benches to be movable by one person, and to be capable of being linked to form a stage;
- Seating to be integral with the bench, so that when the benches are stored or configured as a stage no additional storage is required for seating;
- Maximum lockable storage available within the volume of the bench;
- No permanent projection above the flat upper bench surface;

- Power and data available on each bench via a single umbilical supply;

No ready-made solution meeting these criteria could be found from a commercial supplier so a custom solution was designed and 50 benches were commissioned from British Thornton [1].

Key features of the benches are:

- The envelope for each bench is 2,000mm x 1,000mm x 920mm. Nothing protrudes beyond this envelope so benches can be abutted without gaps
- Load capacity (including the storage units/stools) is 900 kg
- Large castors
- Centre shelf which can be raised for storage and mounting of (e.g.) instruments (see Figure 4)
- Umbilical cord carrying power to six sockets and data to six outlets
- Stools/storage units with two castors and two fixed legs, which mount on steel plates within the bench for moving
- Bold colour-coded doors, so that each bench carries six stools of different colour, in which one team can store its tools, components and part-completed work. Thus the first-year students can be allocated the yellow cupboards, while second years have green etc.
- Every stool and every bench is numbered so that it can be identified after re-arrangement.

So far there has been no formal feedback from the student users, but anecdotally the benches have been well received, and the staff responsible for deploying them have found them easy to work with.



Figure 1 The benches in use by teams of six students



Figure 2 A bench in use for a bridge building exercise



Figure 3 Sixteen of the benches configured as a stage



Figure 4 The benches configured to create a large open space for "operation"



Figure 5 A bench with the central shelf raised and one storage seat removed

A plan of the bench and further pictures will be available at the conference on a CD.

REFERENCE

[1] British Thornton ESF Ltd, Prospect Works, South Street, Keighley, W. Yorks, BD21 5AA, UK; www.british-thornton.co.uk

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Biographical Information

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