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Revisiting the applicability of learning curve theory to formwork labour productivity

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Abstract

The learning phenomenon has proved applicable in various industries, especially those associated with mass productions, such as aircraft and automobile assembly. The learning process in labour-intensive industries is assumed to be more significant in the sense that automated work is constrained by the fact that machines cannot benefit from previous experience and therefore would not ‘learn’ to run any faster or increase the rate of production. Several previous investigations into the applicability of learning curve theory to the construction industry proved the importance of this concept to labour productivity. Nevertheless, a thorough examination of the literature revealed a dearth of research into the effect of learning on the formwork operation of building floors. Consequently, the objective of this research is to explore the influence of recurring building floor configurations on formwork labour productivity. To achieve this objective, formwork labour inputs from 45 multi-storey in situ reinforced concrete

building frames were collected and analysed using the straight-line learning curve model. The cumulative average input for each cycle, i.e. floor, and its associated cycle number were modelled using the least squares method. According to the learning curve theory, we expect the labour inputs to decrease by a certain percentage, as the cycle number increases. Based on the results obtained, there is very little evidence for that.

Keywords:

Formwork | labour inputs | labour productivity | learning curve theory | learning phenomenon

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