LEARNING CURVE ON CONSTRUCTION WORKS

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ABSTRACT

Anyone who performs a same complex task several times in succession under the same general environmental conditions knows that it takes less time to perform the second cycle than the first, less time to perform the third cycle than second, and so on, this phenomenon known as the learning or experience effect. Incorporation of the learning phenomenon in that repetitive construction projects provides a more reliably predicting over the duration of the entire projects, resulting in more accurate scheduling and costing. The study was to identify the labour learning rate on construction works of five randomly selected housing construction projects on current practices. Daily visits and observation were carried out to obtain the unit production time of the ongoing construction activities on sites. Every unit production time and other particulars were recorded in data collection forms to identify the factors that influence the labour learning. Data collection was done on five different construction sites and seven activities were observed. The unit production time of each observed activities was developed to cumulative average unit production time, then plotted in log-log scale graph to obtain learning curve. The learning rate was calculated based on the straight-line model formula. Analysis was carried out on each activities' learning rate, the learning rate of those different activities were compared and state the factor that influenced the learning rate. It was found that the labours involved in repetitive construction activities were affected by learning curve effect and the labour learning rate on construction works were between 94.47% and 99.17%. The study had also found out that learning rate of each task was a function of various factors like work complexity, skill requirement and coherence among crew members. The skills of the labour, experience, and motivation to learn were highly developed, so the effect of learning was very little.

ABSTRAK

Siapapun yang melaksanakan tugas kompleks yang sama beberapa kali berturut-turut dalam keadaan persekitaran umum yang sama didapati bahawa masa yang lebih singkat untuk melakukan kitaran kedua daripada yang pertama, lebih sedikit masa untuk melakukan kitaran ketiga dari kitaran kedua, dan seterusnya, fenomena ini dikenali sebagai kesan pembelajaran atau pengalaman. Jadi penggabungan fenomena pembelajaran di projek pembinaan yang berulang-ulangan boleh memberi prediksi yang lebih dipercayai selama keseluruhan projek, sehingga menjadi penjadualan dan kos lebih tepat. Kajian ini telah dilakukan untuk mengenalpasti kadar pembelajaran pekerja pada kerja pembinaan pada lima projek pembinaan perumahan yang dipilih secara rawak. Kunjungi harian dan pemerhatian telah dilakukan untuk mendapat masa pengeluaran seunit dari aktiviti pembinaan yang sedang berlaku di tapak bina. Setiap unit pengeluaran masa dan keterangan yang lain dicatat dalam borang pengumpulan data untuk mengenalpasti faktor-faktor yang mempengaruhi pembelajaran pekerja. Pengumpulan data ini telah dilakukan pada lima lokasi tapak pembinaan yang berbeza dan jumlah tujuh aktiviti telah diamalkan. Masa pengeluaran seunit dari setiap aktiviti yang diperhati telah mengembangkan kepada kumulatif purata, kemudian diplot dalam graf skala log-log untuk mendapatkan lengkungan pembelajaran. Kadar pembelajaran telah dikira berdasarkan rumus model garis lurus. Analisis telah dilakukan pada kadar pembelajaran untuk setiap aktiviti, kadar pembelajaran dari aktiviti yang berbeza telah berbanding dan menyatakan faktor-faktor yang mempengaruhi. Pekerja yang terlibat dalam kegiatan pembinaan berulang menghadapi kesan lengkungan pembelajaran dan kadar pembelajaran pekerja pada pembinaan adalah antara 94.47% dan 99.17%. Kajian ini telah mendapati bahawa kadar pembelajaran tugas masing-masing dipengaruhi dari pelbagai faktor seperti kesusahan pekerjaan, keperluan kemahiran dan koherensi antara anggota pekerja. Kemahiran, pengalaman, dan motivasi untuk belajar telah sangat berkembang, sehingga kesan pembelajaran sangat sedikit.