UNIVERSITEIT GENT

FACULTEIT ECONOMIE EN BEDRIJFSKUNDE

TWEEKERKENSTRAAT 2
B-9000 GENT
Tel. : 32 - (0)9 – 264.34.61
Fax. : 32 - (0)9 – 264.35.92

WORKING PAPER

Introducing Learning Effects in Resource-constrained Project Scheduling

Vincent Van Peteghem

Mario Vanhoucke

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Introducing learning effects in resource-constrained project scheduling

Vincent Van Peteghem[1] and Mario Vanhoucke[1,2]

[1]Faculty of Economics and Business Administration, Ghent University, Tweekerkenstraat 2, 9000 Gent (Belgium), vincent.vanpeteghem@ugent.be
[2]Operations and Technology Management Centre, Vlerick Leuven Gent Management School, Reep 1, 9000 Gent (Belgium), mario.vanhoucke@ugent.be

Abstract

Learning effects assume that the efficiency of a resource increases with the duration of a task. Although these effects are commonly used in machine scheduling environments, they are rarely used in a project scheduling setting. In this paper, we study and model learning effects in a project scheduling environment and apply the model to the discrete time/resource trade-off scheduling problem (DTRTP), where each activity has a fixed work content for which a set of execution modes (duration/resource requirement pairs) can be defined. Computational results emphasize the significant impact of learning effects on the project schedule, measure the margin of error made by ignoring learning and show that timely incorporation of learning effects can lead to significant makespan improvements.