Dynamic Integrated Learning: Managing Knowledge Development in Road Transport

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STATEMENT OF ORIGINAL OWNERSHIP

I hereby certify that this work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signed:                  Date:  15 December 2010
During the course of this project, a number of public presentations have been made which are based on the work presented in this thesis. They are listed here for reference.


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(Volvo Trucks Australia and Mercedes-Benz Australia product information, including diagrams and images, used in this paper are not to be reproduced without prior written permission.)
This investigation seeks to understand and elaborate how learners who work in circumstances that might be described as being relatively socially isolated come to further develop their working knowledge. The focus here is on road transport workers (i.e. truck drivers) who often work alone, yet are faced with learning to accommodate and respond to new work challenges and ways of working. Increasingly, these workers are required to engage with and understand work knowledge that is represented symbolically through computerised display systems and that requires capacities distinct from those required by earlier generations of road transport workers. In particular, how road transport operators learn new types of knowledge, in view of the recent introduction to heavy road transport of technologies such as computerised engine management systems, automatic gearboxes, and computerised displays (also known as Driver Information Systems or DIS), is considered within this study. Moreover, given the relative social isolation that comprises their work, it is important to understand how the personal and social (i.e. internal and external) contributions to learning development interact in this process of learning.

The road transport sector has been quick to introduce new technology into its operations, which is changing the way information and knowledge is presented to drivers, from the “old” technology where it was explicit, to the “new” technology where the knowledge required for performance is abstract, remote, and “hidden”. Subsequently, these drivers’ ways of thinking and learning must change to make the transition from the old technology to the new. So, while technologies have been introduced to manage emissions, reduce maintenance costs, increase safety, and make road transport more economically competitive, they sit alongside increased demands associated with vehicle utilisation. Also, integrated electronic systems have changed how information is presented to the driver through abstract computerised symbols. Additionally, these systems have replaced the earlier methods of driving, which previously relied on sensory inputs such as vibrations, sound, and even smell, and instead require a new set of cognitive skills that are reliant on a higher order of conceptual knowledge. The ability to learn these new types of knowledge, therefore, has implications for developing and maintaining professional competence in a rapidly changing society.

Whilst recent research has identified interrelations between both personal and social contributions to individuals’ learning and knowledge development, and how they
interact, to varying degrees, there is a need to map a comprehensive account of how these learning practices are enacted in situations of relative social isolation where many people work and learn. Hence, this dissertation advances an integrated account of this learning that combines both individual and social influences to explain the underlying processes that affect knowledge construction. Moreover, as much learning occurs throughout working life, such as in the case of road freight transport workers where it occurs in relative isolation without the benefits of expert guidance, supervision, or help, there is a need to account for how individuals’ personal agency and self-directed learning are exercised in these circumstances, particularly when addressing learning that is difficult to access and construct. Hence, a direct contribution provided through this dissertation is a model that builds on the knowledge-creation approach to learning proposed by Paavola et al. (2004) and Nonaka and Takeuchi’s (1995) model of knowledge creation. The Dynamic Integrated Learning Model, proposed here, builds upon and assists in explaining the dynamics and interrelatedness of different factors that contribute to learning and, therefore, enhance workplace performance.

The findings both support and further elaborate the concept of a relational interdependence between social and personal contributions as an explanatory base to understand workers’ learning and development. As such, they support Billett's (2006b) claim that, "rather than being reciprocal or mutual, these relationships are negotiated and differ in intensity: they are relational" (p. 14). Furthermore, the research identified that there was interdependence between social and personal factors and these were enacted relationally depending upon both situational (i.e. work tasks) and individual factors (i.e. personal preferences and knowledge).
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