

## **Promoting Teachers' Innovative Behaviour:**

### **The roles of interdependence, Occupational Self-Efficacy and Learning Goal Orientation<sup>1</sup>**

#### **Introduction**

The need for organizations to innovate in order to adjust themselves to environmental uncertainty and on-going technological developments is nowadays beyond any doubt (see for example Amabile, 1997). At the employee level, this means that employees are expected to exhibit innovative behaviour, defined as the multistage process by which employees first *invent* new ideas, then seek *sponsorship* for the new idea and finally *implement* the idea into their practice (Scott & Bruce, 1994; Van de Vegt & Janssen, 2003).

Innovative behaviour has especially become increasingly important in schools as in this specific sector large innovations are going on like curriculum reform on behalf of new standards set by governments, the introduction of new pedagogical concepts and new technological teaching tools (see for example Fullan, 2007). The role of teachers in bringing these innovations into practice is of crucial importance; teachers' willingness and ability to change and invent new didactic methods are key (Desimone, 2002). Hence, research on explaining teachers' innovative behaviour has become increasingly relevant. However, innovative behaviour up till now is primarily investigated in for-profit organizations.

The increasingly widespread use of teamwork has led researchers to investigate how innovative behaviour is influenced by team characteristics. For example research showed that the way that roles and tasks are divided and the manner in which goals are defined and achieved

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<sup>1</sup> The paper contains 1933 words (tables, figures and references excluded).

influence interpersonal relationships (Wageman, 1995), what in turn can be viewed as an important antecedent of innovative behaviour (Van der Vegt & Janssen, 2003).

### *The Interdependence – Innovative Behaviour link*

*Task interdependence* is defined as the work flowing from one team member to another in such a way that the task performance of one member depends on the task performance of the other (Kiggundu, 1981) and *goal interdependence* refers to the extent to which team members' benefits and costs depend on successful goal attainment by other members (Deutsch, 1980). Task interdependence enhances the interaction between employees (Campion et al., 1993) and the quality of the interaction in terms of employees' feelings of more responsibility for the task outcomes of others (Kiggundu, 1993) and to employees seeking and providing each other from advice (Wagner, 1995). Goal interdependence leads to employees' feeling motivated to find manners in which mutual goals can be achieved and employees resolving issues for mutual benefits. Goal interdependence is positively related to open-minded discussion and diverse views (e.g. Deutsch, 1980). The more task interdependence, the more people have the opportunity to promote or hinder others' performance. Whether or not employees will use this influence positively (promote each other's performance) or negatively (hinder others' performance), depends on the extent to which they perceive their goals are mutually defined (Van der Vegt & Janssen, 2003); hence, as a result innovative behaviour will be more likely to occur under the circumstance of high task and high goal interdependence.

### **Goals and focus of the study**

The *first* purpose of our study is to re-test the effects of task and goal interdependence on innovative behaviour (van der Vegt & Janssen, 2003) in the educational setting. *Second*, since

individual characteristics and (work) environment cannot be seen as independent from each other (Pervin, 1989), we aimed to include individual differences between employees in the analysis of the interdependence – innovative behaviour link. More specifically, we included *occupational self-efficacy* - defined as the conviction that an individual can cope with difficulties s/he encounters in her/his work (Bandura, 1995; Schyns & von Colliani, 2002) - and teachers' *learning goal orientation* - which refers to the motivation to improve one's competencies through learning and training new skills, as well as through learning to complete new and more complex tasks (Dweck & Legett, 1988) - as mediators in the relationship between task and goal interdependence on the one hand and innovative behaviour on the other hand.

### **Conceptual framework**

Innovative behaviour can be viewed as an additional demand in teachers' jobs. According to demands-resources theories in organizational psychological research (see for an overview Bakker & Demerouti, 2007), when demands exceed employees' resources to cope with the demands, this will lead to employees avoiding the demand. In contrast, when the resources exceed the demands, then this will stimulate employees to meet the demands. As such, demands can be appraised in two ways: as a *threat* or as a *challenge*. While 'threat' refers to a potential for harm or loss, 'challenge' is associated with the opportunity for growth, mastery, or gain (Folkman, 1984). Threat and challenge are not mutually exclusive. For example, innovative behaviour is likely to be appraised as holding the potential for competence development, impact and recognition (e.g. Amabile 1997). At the same time, it entails the risk of being confronted with resistance from colleagues, failure and negative feedback (e.g. Janssen et al., 2004). Hence, we believe that a high sense of occupational self-efficacy and a high learning goal orientation will serve as personal resources in that these will help teachers to cope with the threats associated with

innovative behaviour and to recognize the potential for personal growth inherent to innovative behaviour respectively.

Now back to the interdependence – innovative behaviour link; resources to cope with demands (whether appraised as threats and/or challenges) can be personal and situational in nature (e.g. Bakker & Demerouti, 2007; Gregoire, 2005). While occupational self-efficacy and learning goal orientation are considered personal resources, interdependence can be viewed as a situational resource. The degree to which one is convinced about one's ability to control the risks associated with the demands is partly dependent on how one appraises the support from the environment in case of failure (Bandura, 1977; Folkman, 1984). Following this reasoning we propose that when teachers perceive a high task and goal interdependence within their team, this will enhance their occupational self-efficacy and learning goal orientation and consequently – because of the reasons stated above - their engagement in innovative behaviour.

## **Method**

### *Respondents*

397 teachers working in 28 teams of a Dutch Vocational Education and Training (VET) institution participated in this study (response rate = 38%). 53% were women. Nine percent was younger than 40 years old. 35% was between 40 and 49 years of age, 56% was older than 50. One percent received secondary vocational education, 87% received higher vocational education, and 12% of the respondents had a master's degree.

### *Instruments*

In this study we used an online questionnaire, containing existing validated scales. All items were measured by using 5 point Likert scales (1 = totally disagree, 5 = totally agree). See Table 1 for the details.

Table 1: Overview of study instruments

<b>Variable</b>	<b>Source</b>	<b>Items</b>	<b>Reliability</b>
<b><i>Innovative behaviour</i></b>	De Jong and den Hartog (2005)	12 items, like: <i>'I am engaged in examining new methods and instruments'</i> <i>'I promote and defence my innovative ideas towards others'</i>	Cronbach's $\alpha = .87$
<b><i>Task interdependence</i></b>	Van der Vegt et al (1998)	Six items, such as: <i>'To do my job well, I need information from my colleagues'</i>	Cronbach's $\alpha = .81$
<b><i>Goal interdependence</i></b>	Van der Vegt et al (1998)	Seven items, like: <i>'In our team, we all want to achieve the same goals'</i>	Cronbach's $\alpha = .70$
<b><i>Occupational self-efficacy</i></b>	Schyns and Von Collani (2002)	Six items. For instance: <i>'Whatever happens in my work, I usually can cope with it'</i>	Cronbach's $\alpha = .81$
<b><i>Learning goal orientation</i></b>	VandeWalle (1997)	Five items, such as: <i>'I am prepared to do challenging tasks from which I can learn a lot'</i>	Cronbach's $\alpha = .85$
<b><i>Control variables.</i></b>	Pre-structured questions were used to determine age (1 = <30 years, 2 = $\geq$ 30-39, 3 = $\geq$ 40-49, 4 = $\geq$ 50-59, 5 = $\geq$ 60), sex (1= man, 2 = woman) and level of education (1 = secondary vocational education and training, 2 = higher vocational education and 3 = university).		

### *Data analysis*

Cross-sectional data are vulnerable to common method bias. Hence we started the data analysis with assessing the severity of common method variance in two ways. *First*, we conducted the Harman's One-factor test (Podsakoff, & Organ, 1986) and a Confirmatory Factor Analyses. These analyses provided evidence that inter-item correlations in our study were not primarily driven by common method bias. To examine the joint effect of task and goal interdependence the raw scores of task and goal interdependency were first centralized and then their product were calculate to represent the interaction effect (Aiken & West, 1991). Innovative behaviour was regressed on task-, goal-interdependency, and their interaction terms simultaneously.

To test the mediation effect of self-efficacy and learning goal-orientation, we used Preacher and Hayes' (2008) approach of testing multiple mediators, which builds on the causal steps strategy described by Baron and Kenny (1986), and assumes that M acts as a mediator in the relationship between predictor X and outcome Y when X is significantly related to M (path a), and M is significantly related to Y (path b), and the effect of X on Y (path c) is substantially decreased when M is simultaneously entered with X as a predictor of Y (path c').

Because teachers are nested within teams, the data are not independent and multi-level analysis should be considered. Due to our interest in person-to-person differences, with the two mediators at the individual level as well, we chose to analyse our data only at the individual level (Bickel, 1997). The values of ICC1 (Bliese, 2000) of our concerned variables were in the range between .09 and .11, meaning that only nine till eleven percent of the variance of those variables was related to the team level while 89 to 91% was related to the individual level.

## RESULTS

### *Descriptive statistics*

In Table 2 means, standard deviation and interrelationships between study variables are shown.

Table 2: Means, standard deviations and correlations between study variables

	M	SD	1	2	3	4	5	6	7	8
1. Sex	1.47	0,50								
2. Age	3.52	0,78	-.09							
3. Education	2.11	0,34	.04	.06						
4. Innovative behavior	3,73	0,47	.01	-.13*	.07					
5. Task interdependence	3,03	0,55	-.05	-.08	-.02	.21**				

6. Goal interdependence	3,34	0,50	-0,09	.08	-.13*	.05	.37**		
7. Occupational self-efficacy	3,84	0,50	-.02	.04	.09	.41**	-.02	.13**	
8. Learning goal orientation	3,73	0,57	.09	-.13**	.10	.60**	.12*	.08	.48**

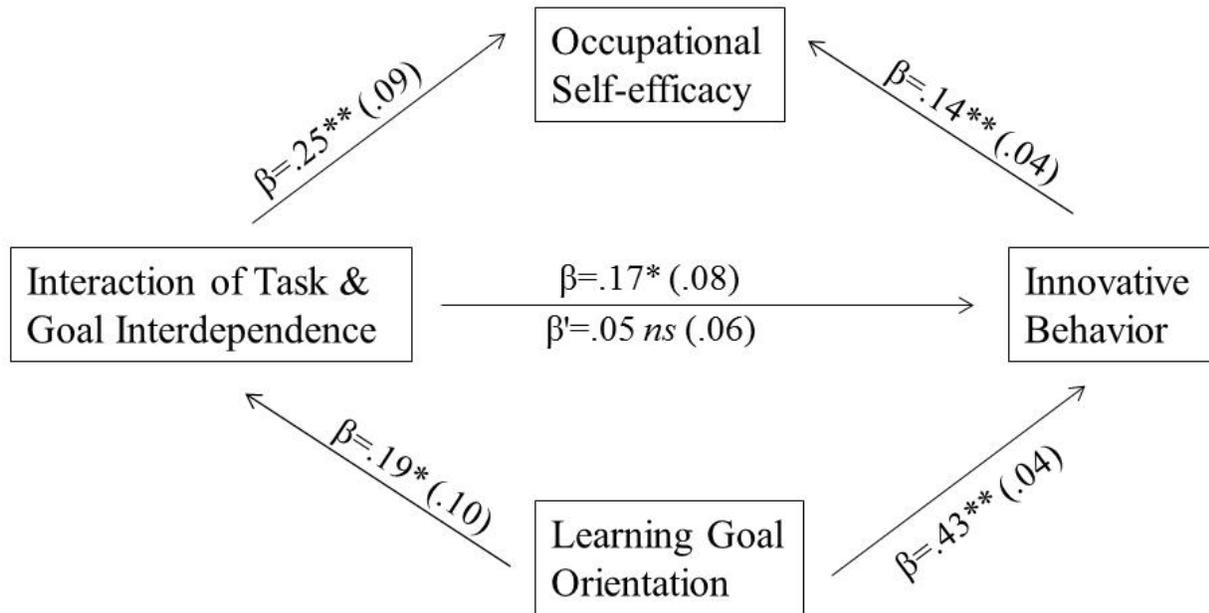
\*p<.05; \*\*p<.01

### *Testing the hypotheses*

The results of the testing of our multiple mediator model are presented in Table 3 and Figure 1<sup>2</sup>. As shown in Figure 1, the interaction effect of task and goal independency had a significant effect on innovative behaviour ( $\beta = .17, p < .05$ ). A depiction of this interaction effect was in line with the findings of Van der Vegt and Janssen (2003): it confirms the theoretical arguments that task- and goal-interdependence work together in influencing innovative behaviour.

<sup>2</sup> We also conducted the analysis with control variables and yielded comparable results.

Figure 1: Mediating effects of occupational self-efficacy and learning goal orientation in the relationship between the interaction of task and goal interdependence and innovative behaviour.



Note: All coefficients represent unstandardized regression coefficients.

Table 3: Normal theory tests for indirect effects.

	Effects	se
Total	.118*	.049
Occupational self-efficacy (OSE)	.035*	.016
Learning goal orientation (LGO)	.083*	.051
Contrast OSE - LGO	-.048 <i>ns</i>	.041

\*= $p < .05$

The results showed a positive relationship between the interaction of task and goal interdependence and occupational self-efficacy and a positive relationship between occupational

self-efficacy and innovative behaviour. Finally, the effect of the interaction of task and goal interdependence on innovative behaviour decreased (from .17 to .05) and became insignificant when the mediator variable was entered. Table 3 shows that the specific mediating effect of occupational self-efficacy on the relationship between the interaction of task and goal interdependence and innovative behaviour was .035 and statistically significant.

As shown in Figure 1, the interaction effect of task and goal interdependence was positively related to learning goal orientation. Furthermore, learning goal orientation was positively related to innovative behaviour; the effect of the interaction of task and goal interdependence on innovative behaviour is decreased (from .17 to .05) and became insignificant after inclusion of the two mediators. As Table 2 shows, the specific mediating effect of learning goal orientation was .083 and statistically significant. Table 2 also shows that the strength of the two mediating effects (via occupational self-efficacy and via learning goal orientation) did not significantly differ from each other (contrast = -.048, *ns*).

## **Discussion**

The cross-sectional design of the study raises questions concerning the causality in the relationships we found. Although the direction of the relationships between study variables is scientifically underpinned, it could be that the relationships are reverse or reciprocally causal over time. Second, although people generally are able to accurately perceive themselves and their environment (e.g. Alper, Tjosvold & Law, 2000) other sources of information would have strengthened the validity of our results.

Our study builds on former research on the interdependence – innovative behaviour link by showing the mediating roles of occupational self-efficacy and learning goal orientation in this relationship. Next to this theoretical contribution, the results suggest that schools can gear the

tasks of teachers to one another, for instance, by asking from teachers that they develop and execute a number of multidisciplinary lessons. By collaborating with colleagues from different subject-matter departments, more exchanges of ideas and methods can occur than when collaboration is limited to colleagues from the same department.

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