Students' Motivation in Longitudinal Perspective:

The influence of Potential, Personality and Learning context

Nowadays, collaborative skills have become an important graduate attribute for future highly-educated professionals, which provides learning goals in higher education programs. This study focuses on how a collaborative learning environment influences the motivation for task and collaboration in students. Additionally will be seen what role a students' cognitive ability, creative ability, and personality plays. All variables are modeled in a full structural equation model. The results show that a feeling of group safety can positively affect a student's motivation to collaborate in a future task, while a higher task complexity has a negative influence. Work load does not affect students motivation for collaborative learning. Cognitive able students are more willing to collaborate than creative able ones. And conscientiousness and extraversion show moderate direct effects on motivation after the task. So the learning context seems important, but so is the personality of the students.

Collaborative skills have become an important graduate attribute for future highly-educated professionals, partly due to the growing knowledge economy. As a result, higher education intends to educate 'excellent collaborators' and promote 'excellent collaboration'. In line with these intentions, this study focuses on how a collaborative learning environment influences the motivation for task and collaboration of students with different potential for excellence from before to after a collaborative task. We consider excellence as a manifestation of behavior, rather than just a students' ability (Subotnik, Olszewski-Kubilius, & Worrell, 2011). Hence, when we try to understand (excellent) collaborative behavior it is important to not only focus on students' ability but also on the collaborative setting in which they act (Barab & Plucker, 2002).

Two frequently used indicators of potential for excellence are intellectual ability and creativity (Barab & Plucker, 2002). Besides potential, this study also considers students' personality, because other student characteristics than potential for excellence might be relevant in understanding students' perceptions regarding collaborative learning environments. As far as the interaction between collaborative settings and potential is concerned, little is known about how students' with a different potential for excellence interact with a collaborative learning environment.

To consider the interaction between the perceived collaborative learning environment and the development of students' motivation, both the environment and the motivational aspects are important. Motivation is, next to potential for excellence, important for successful student collaboration, because it positively influences the interaction within a team of students (Rienties, Tempelaar, Van den Bossche, Gijselaers, & Segers, 2009).

In the current study, students' motivation is not considered a stable feature, but a feature that is influenced by the educational setting in which students act (Wolters & Pintrich, 1998). Self-efficacy beliefs influence the goals that students set, the amount of effort that students put in a certain activity and the persistence of students (Bandura, 1997; Pintrich & Schunk, 2002). Additionally, when students'

motivation for collaboration is considered both their motivation for the specific task as well as the motivation for the specific collaborative setting are relevant (Walker, Shore, & French, 2011). Hence, motivation can be divided into aspects of task-related motivation as well as aspects of collaborative motivation (Johnson, Johnson, & Holubec, 1994), resulting in four related constructs: 1) task-related values, 2) task-related self-efficacy 3) collaborative values, and 4) self-efficacy for collaborative learning. In collaborative settings this distinction is important because a student could be motivated to work on the content of a certain task, but this does not directly imply that the student is motivated to collaborate on that task. Conversely, a student could be motivated to work in a collaborative setting, but the content of the collaborative task does not arouse the interest of the student.

In order to provide a good image of a collaborative learning environment it is also important to regard both group dynamics and task aspects (Lizzio & Wilson, 2005). Previous research has shown that when students feel safer within a team they show more positive collaborative behavior (Van der Bossche, Gijselaers, Segers, Woltjer, & Kirschner, 2011). When focusing on task aspects, students often mention problems concerning a high workload, and difficulty with the interrelated aspects of a task, which makes workload and perceived complexity important aspects to consider (Lizzio & Wilson, 2005) (Kyndt, Dochy, Struyven, & Cascallar, 2011).

Combined this results in the research questions: To what extent influences the collaborative learning environment the change in motivation for collaborative tasks of students? And, what role does potential for excellence and personality play?
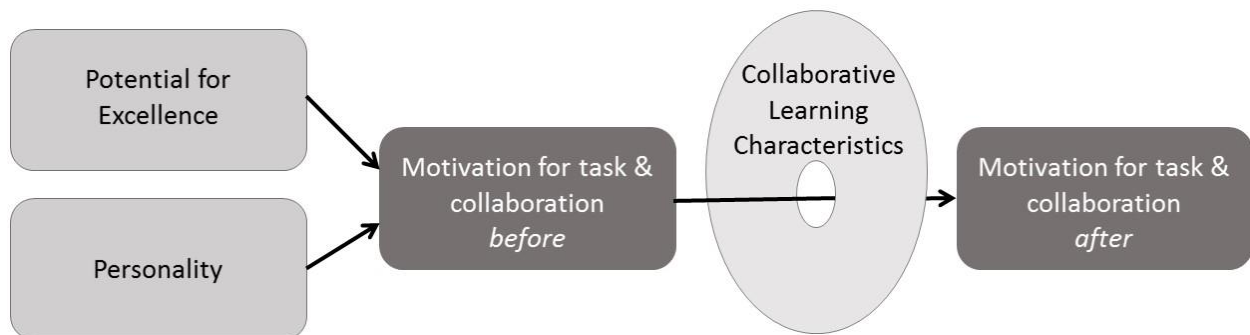

Figure 1: Overview of variables.

Method

Sample
Undergraduate students from diverse educational programs were asked to participate in a paper-and-pencil questionnaire (N=956). The educational programs were selected based on having an authentic collaborative task scheduled, and each having differences in number of students per collaborative group, and differences in collective time on task, to provide diverse surroundings. All collaborative tasks were based on interdependence among the students since all students were collectively graded (min 60%, max 100%).

Measurements

	Variable	Crohnb alpha pre/post	Instrument / items	Based on
Potential for Excellence	Intellectual ability		Three subtests of the Multicultural Capacity Test for Higher Education (MCT-H)	Bleichrodt and Van den Berg (1999)
	Creative Potential		Alternative Uses Task	Guilford (1967)
	Personality		NEO Five Factor Inventory (NEO-FFI)	Costa and McCrae (1992)
Motivation for Collaborative Learning	Task Efficacy	.74 / .83	Self-efficacy for teamwork scale, 6 items	Eby and Dobbins (1997)
	Task Value	.80 / .88	Newly developed, 7 items	The Motivated Strategies for Learning Questionnaire (MSLQ) by Pintrich, Smith, Garcia, and McKeachie (1991)
	Collaborative Efficacy	.80 / .83	Newly developed, 8 items	Bandura (2006)
	Collaborative Value	.80 / .81	Newly developed, 3 items	The preferences for group work scale by Shaw, Duffy, and Stark (2000)
Learning Environment	Workload	.86	7	Kyndt et al. (2011)
	Task complexity	.79	7	Kyndt et al. (2011)
	Group safety	.76	7	Edmondson (1999)

Analysis and Model Fit

The measurement scales were constructed based on factor analysis and reliability analysis, resulting in scales with a crohnbach's alpha between .60 and .88 (SPSS22). The latent factors were confirmed in a structural factor model, with $X^2(2942)=7624.526$; p<.000; RMSEA=.042. To answer the research question, a full structural equation modeling (SEM) analysis was conducted, by adding the structural model and then applying a model trimming procedure, and adding relations based on modification indexes, all in Mplus7. Adding the structural model decreased model fit, with $\Delta X^2(85)=373$; p<.000 but resulted in a final model of close fit, with $X^2(3027)=7997.155$; p<.000; RMSEA=.043.

Findings

The results show that an increased cognitive ability is positively and an increased creative ability negatively related to all motivational constructs. Of the personality constructs, openness and agreeableness related negatively to most of the motivational constructs, while extraversion shows a positive effect. And while task complexity and group safety do influence the motivational change of students, the motivation of students before a task have the biggest effect on the motivation afterwards. So one can wonder if the attention to the phase before the start of working together in groups shouldn't receive more attention. Additionally, an increased feeling of group safety does have a positive effect on the motivation of students, while an increased perceived task complexity has a negative effect. Work load does not affect the motivation of students after a collaborative task. Also, surprisingly, a higher level of extraversion directly relates to the task-related motivation after the task, while conscientiousness directly relates to the efficacy motivational constructs after the task. For these

students, their personality provides continuity in their motivation for collaborative learning. Implications are discussed during the presentation.

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