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The relationship between the quality of cooperative learning, students' goal preferences, and perceptions of contextual factors in the classroom

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This study examined relationships between the quality of cooperative learning (CL) and students' goal preferences and perceptions of contextual factors in the classroom. Subjects were 1,920 students in secondary vocational schools. The study focused on four different types of goals: social support, belongingness, mastery, and superiority goals. It was found that social support goals had the strongest relation with the quality of CL. Further we found that the quality of CL was best predicted by a combination of social support goals, evaluations of the extent that students were taught cooperation skills, perception of teacher monitoring behavior, and the availability of academic and emotional peer support. Female students' preferences for mastery and social goals were stronger than those of male students, whereas male students had a stronger preference for superiority goals. Program type functioned as a moderator variable within the relation of students' superiority/ individuality goals and the quality of CL.

Key words: Motivation, cooperative learning, contextual factors, vocational education.

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INTRODUCTION

This paper reports a study into the relationship between motivational processes, contextual factors and the quality of cooperative learning (CL) processes of adolescent students in secondary vocational education in the Netherlands. We view motivational processes as an intricate part of the students' self-regulation process, namely that part that is steered by their values and goal preferences. It is generally assumed that students steer their behavior in the direction of valued goals and away from non-valued goals (Boekaerts, Pintrich & Zeidner, 2000). This is not to say that students are working with a clear goal dichotomy in mind; personally valued and non-valued goals. Rather, our position is that many goals are located in between these two extremes. Indeed, students are presented with multiple goals in the school context. Some students might classify these goals in terms of desirable and undesirable ones but for the majority of students the classification process might be more complex. Several researchers, such as Deci and Ryan (1985) and Ryan and Deci (2000) argued that most students will determine to what extent school goals are similar to – or might be combined with – personally liked goals; they try to bridge the span between imposed and personal goals, by “personalizing” the former type of goals (e.g., Lemos, 2002). We assume that students' motivation levels at school largely depend on their perceptions of the connection between their personal goals and the school goals.

We expect that the students' perception of the quality of CL depends to a large extent on the goal preferences that they bring into the classroom. On the other hand we expect

that their perception of the classroom context itself, and more specifically the way they perceive teacher behavior and the support they get from teacher and peers, determines the quality of CL as well. For example, we expect that the students' perceptions of the extent to which they were taught cooperation skills (*How* information) and the social reasons they consider important for CL (*Why* information) will affect how they appraise the quality of CL. For future intervention purposes, attention to how students perceive the CL setting is of prime importance. Our position is that, although students' goal preferences have a large impact on their perception of the quality of CL, it is difficult to influence their goal preferences in a short period of time. By contrast, information about the contextual factors that influence students' perception of CL may provide researchers with useful information to hand down to teachers and trainers. We realize that adaptations to classroom settings are much easier to generate than changes in students' goal preferences.

In this paper, we attempt to expand the focus of goal preferences from the achievement domain to the social domain, acknowledging the large role played by students' perception of the social context. The article is organized into three main sections. First, we describe the quality of CL as the general beliefs students have about the reasons for learning with and from each other and their awareness of how they have to go about learning in the CL setting. Second, we describe the relation between goal preferences and CL. In the third section we describe how goal preferences and perception of contextual factors is conceptualized in the present study and report on the results.

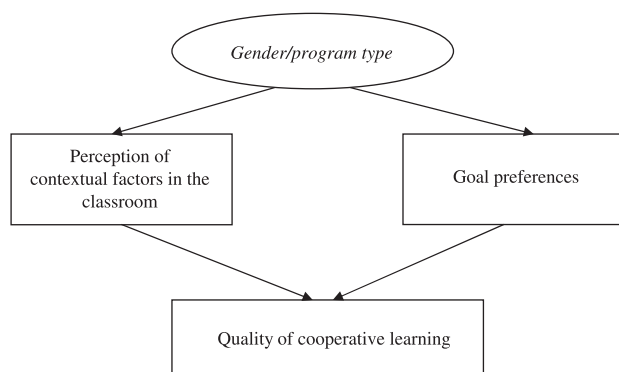


Fig. 1. Model of research.

The quality of cooperative learning

CL is not just a learning theory or a teaching method, it refers to a set of instructional principles that together describe *how* students might learn from and with each other and, through working together, accomplish academic tasks. Successful CL situations require in the first place that students have positive beliefs about CL. In order to feel responsible for group learning students also need to be aware of the skills that should be used and have easy access to these skills. For example, students should make use of a number of *co-operation skills*, including the skill to express their own opinion, stimulate each other, provide and receive help, listen to each other and clarify their current understanding of the task (Cohen, 1994; Ros, 1994; Webb & Palincsar, 1996). Furthermore, students need to feel responsible for each other's learning process and experience a sense of *group cohesion* and *interdependence* (Johnson & Johnson, 1994; Ros, 1994; Webb & Palincsar, 1996). Chin, Salisbury, Pearson and Stollak (1999) and Cohen (1994) pointed out that the activity level in the group is at its best when students feel at home in the group. Based on a literature review we defined the students' perception of the quality of CL in terms of their perception of the group cohesion and their own skills to participate successfully in CL.

It is easy to imagine that the shift of responsibilities from teacher to students that is implied by CL may come with a variety of problems when students lack a positive attitude towards CL or the skills to work together. For example, students may take the opportunity to work alone instead of together (Vedder, 1985; Veenman, Kenter & Post, 2000), they may disturb each other's learning processes (Salomon & Perkins, 1998; Shanahan, 1998) or reduce effort, resulting in lowered levels of engagement (Gagné & Zuckerman, 1999). We assume that these and similar problems come about because the students perceive the quality of CL as suboptimal.

Goal preferences and cooperative learning

We divided the studies that examined the relationship between students' goal preferences and the quality of the

learning process into two categories. The first category examined the relationship between one type of goal, namely achievement goals, and the quality of the learning process. The second category focused on the relationship between multiple goals and the quality of the learning process.

Several researchers took the mastery vs. performance dichotomy as their frame of reference (e.g. Ames & Archer, 1988; Dweck, 1986; Urdan, 1999). These studies documented that students who are mastery-oriented engage in tasks because they want to acquire new knowledge and skills; their purpose is to develop competence. Performance-oriented students on the other hand, want to demonstrate competence relative to others. Boggiano, Main, Flink, Barrett, Silvern and Katz (1989) and Dweck (1986) suggested that students who have a strong preference for performance goals might easily run into problems when they have to cooperate. These students might interpret unsolicited help and support as a threat to their ego, leading to avoidance of CL situations. Functioning as a group member may contrast with their wish to perform well at a more individual level (see also Schwartz & Bardi, 2001). By contrast, mastery goals are associated with high levels of performance on personally challenging tasks in general. Students who pursue mastery goals are not focused on out-besting their peers, they are academically oriented and want to learn something new, even when it implies a lot of effort. Although many studies have been conducted on the relationship between these two goal orientations and learning (for review, see Pintrich, 2000), it is still unclear how these goal preferences are interrelated in CL contexts. In part this is due to the fact that most of the reported studies dealt with learning in general rather than with learning in CL settings.

A more complex perspective on goals preferences was adopted in the second category of studies. Several researchers (Boekaerts, 1998; Dowson & McInerney, 2001; Ford, 1992; Ford & Nicholls, 1991; Lemos, 1996; Wentzel, 1996) argued that students bring different types of goals to the learning situation. In addition to achievement goals, students pursue entertainment goals (e.g., I want to have fun at school), self-determination goals (e.g., I want to determine myself how I do things), working goals (e.g. I want to finish that task) belongingness goals (e.g., I want to make many friends) and social support goals (e.g., I want to provide help to peers).

Urdan and Maehr (1995) argued that social goals concern the social reasons for trying to achieve in academic situations and consequently these goals play a crucial role in a CL setting. Social goals are important to children of all ages (Ford, 1992), particularly to adolescents who often consider these goals to be more important than academic learning goals (Covington, 2000). In this respect, McInerney, Hinkley, Dowson and Van Etten (1998) suggested that a combination of mastery (academic) and social goal orientations might be more productive than mastery goals alone because feelings of belongingness and social responsibility engendered by social goals provide added impetus for academic achievement.

Wentzel's (1991) studies clarified the effect of social goals on learning. She showed that pro-social behavior is positively associated with academic success (Ford, 1992; Wentzel, 1993; 1994) and that CL facilitates goal realization for those students who like to work in CL settings and value group cohesion. Likewise, Connell and Wellborn (1991) and Wentzel (1994) suggested that a sense of belongingness facilitates the adoption of the goals that are valued by the social group to which one belongs. The desire of individuals to achieve for the sake of the group is a well-known phenomenon, and it forms the basis for much of the success of CL (Hertz-Lazarowitz & Miller, 1992).

Goal preferences and perception of contextual factors in the present study

We adjusted Ford's taxonomy (Ford, 1992; Ford & Nicholls, 1991) to measure a broad range of intra- and interpersonal goals. In the present study, we limited the focus to four types of goal preferences that are central to CL settings, namely *mastery* goals (e.g., I want to learn about my future profession), *superiority/individuality* goals (e.g., I want to impress my peers), *social support* goals (e.g., I want to help classmates with their tasks), and *belongingness* goals (e.g., I want to make many friends). In line with Hickey and Granade (2004) and Urdan (1997) we assume that the environment exerts a major influence on the salience of a particular goal and its adoption. Boekaerts, De Koning, and Vedder (in press) reviewed studies that examined the relationship between contextual variables and goal preferences. They listed the context factors that play an important role in the classroom. We based our selection of contextual factors on this review as well as on reviews of studies on CL (e.g. Cohen, 1994; Webb & Palincsar, 1996). More specifically, in this study we concentrate on *instructional characteristics*, such as the type of task, the type of evaluation/rewards, teacher instruction behaviour, teachers' clarity on rules for CL, and students' evaluations of the extent that they were taught CL skills. We also measured the students' perception of *school climate*, including their perceptions of the availability of teacher's academic and emotional support, and the availability of peer academic and emotional support. Research on instructional characteristics revealed that it is essential for effective cooperation that the *task* elicits positive interdependence (see Cohen, 1994). This implies that students should perceive the task as challenging, but not too complex, and that group assignments are structured in such a way that each group member's actions relate to and are required for task completion.

The role of reward in CL is not altogether clear yet. For example, Slavin (1995; 1996) concluded in a meta-analysis that the effects of CL on students' achievement are maximal and the risk at social loafing are minimal, when a group reward is combined with individual accountability for learning and learning outcomes. Other researchers (e.g. Cohen, 1994; Deci & Ryan, 1985) suggested that a combination of

a group reward and an individual reward will undermine the group process.

Teacher (instruction) behavior has proved to be an important factor in several studies. Teachers should facilitate students to complete the group assignments increasingly by themselves. They also need to monitor their students' learning process and intervene when necessary to provide assistance or to model students' social skills (see Johnson & Johnson, 1994), especially when students are not yet used to cooperating. Students prone to off-task behavior should be monitored in particular. Drawing attention to the teacher's role in CL settings, Webb and Palincsar (1996) illustrated that in order to promote CL, teachers should not only define the group assignment adequately; they should also be clear about the *rules for CL*; i.e., teach the required concepts and strategies and give the criteria for success (see also Johnson *et al.* 2002). Webb and Palincsar described comprehensive programs of team building and prosocial skill development that improve peer-to-peer interaction and through it students' social goals. Many other scholars (e.g., Gillies & Ashman, 1996; Hoek, Van den Eeden, & Terwel, 1999; Webb & Farivar, 1994) have shown that *explicit teaching of CL skills* coincides with an improvement of the quality of CL.

The quality of CL is also promoted by a social climate that is characterized by optimal academic and emotional support from teacher and peers. Wentzel (1994) and Wentzel and Wigfield (1998) showed that a supportive social climate promotes group cohesion, the use of cooperation skills, and students' attitude towards CL. In such a climate students feel respected and supported when asking for help. It has also become increasingly clear that a sense of relatedness with the teacher promotes pro-social behaviour, particularly adaptive help-seeking behaviour (Brenner & Salovey, 1997; Newman & Schwager, 1993) and the pursuit of social support goals. Students experiencing autonomy support and optimal structure were more likely to be effortful and persistent while completing learning tasks. Our prediction is that students' perception of the availability of academic and emotional support from peers crucially affects their perception of the quality of CL. A learning environment characterized by social resources will give students confidence that they can rely on each other for support with their school work. In this study we are dealing with adolescents in vocational education. Adolescents must adjust to peer pressure and norms not only with respect to academic performance but also in relation to interpersonal rules for help seeking, helping others, turn taking, and sharing resources. Accordingly, we anticipate that peers will play a larger role than teachers when it comes to turning for assistance.

Gender differences

Early studies (e.g., Gardner, 1993; Gardner, Mason & Matyas, 1989) suggested that girls benefit more from cooperative classroom settings than boys. Several studies, among others

those of Anderman (1999), Charlesworth & Dzur (1987) and Cosden, Pearl & Bryan (1985) revealed that girls are more inclined to engage in behavior associated with successful CL, such as helping others, verbal organization, and turn taking. A recent report from the Organization for Economic Co-operation and Development (2003) also indicates that girls are – in general – more interested in CL than boys. Eccles (1987) and Wentzel (1991) showed that female students, as compared to their male contemporaries, prefer to learn in settings in which they can combine mastery (understanding tasks) and social goals (being with friends, supporting others, creating a sense of belonging and security). Voncken, van der Kuip, Moerkamp and Felix (2000) showed that the way female students experience school is related to feelings of *group cohesion*. All these studies imply that female students rate the quality of CL processes higher than male students. In contrast, school is perceived by male students as a competitive arena, which makes social comparisons and peer pressure dominant in their mental representation of the learning situation. Severiens and Ten Dam (1998) conducted a meta-analysis and reported that male students scored higher on a non-academic orientation than female students and that male students scored higher than females on superiority/individuality goals and lower on both types of social goals. Based on the literature, we expect female students to show higher scores on belongingness and social support goals than male students. We also expect differences in the extent to which male and female students pursue mastery goals. More specifically, we predict that male students will have a lower rating of the quality of CL. In short, we expect gender to function as a moderator variable in the relationship between students' goal preferences and their perception of the quality of CL.

Program type differences

As far as we know, no specific research has been done in this area. Four program types are represented in our sample, namely information and communications technology (ICT) and engineering, retail and administration, health and welfare, and food and tourism programs. It is important to note that male and female students are not equally distributed over these program types and that this uneven distribution might lead to a program type effect that masks an underlying gender effect. Therefore, we will explore program type effects for male and female students separately. Learning how to take care of others is an important aspect of the health and welfare program and students who enrol in this program consider "care" as an important aspect of their future job image. It comes as no surprise that girls are over-represented in this program. We expect that students enrolled in the health and welfare program show a preference for both types of social goals. By contrast, ICT and engineering students look forward to a professional career in a company where they are paid well. They imagine their

future in terms of an adventure in the world of bonuses and free company cars.

Boys are over-represented in these program types. We expect these students to be oriented more towards superiority/individuality goals than to social goals. We did not have clear expectations in relation to the two other program types, albeit that we expected food and tourism students to report a higher preference for social goals than the ICT/engineering students due to the alleged lower social orientation of the latter type of students. Health and welfare students are expected to report higher perceptions of the quality of CL, because these professional groups are seen as more socially oriented. We anticipate that ICT and engineering students score lower on the quality of CL. In line with the expected differences in the scores on the quality of CL and goal preferences, we expect the relationship between students' goal preferences and the quality of CL to differ between the program types, particularly between the health and welfare and ICT/engineering programs.

In summary, we will explore the relationship between students' goal preferences and the quality of CL. We predict that belongingness, social support and mastery goals are positively related and superiority/individuality goal preferences negatively related to the quality of CL. Our second research question pertains to the relationship between the quality of CL and perceptions of contextual factors in the classroom, including social climate. We predict that the students' perception of the quality of CL will be perceived as poor when students score low on the context and social climate variables. We will also explore gender and program type effects on the relationship between students' goal preferences and the quality of CL. We predict that female students score higher than male students on the quality of CL and that female students report higher preferences for social support and mastery goals whereas male students report higher preferences for superiority goals. As far as program type effects are concerned, we hypothesized that health and welfare students and food and tourism students score higher on the quality of CL and on social goals, particularly in comparison with ICT and engineering students. We will examine whether there is gender and program type moderator on the relationship between goal preferences and perception of the quality of CL.

METHOD

Subjects

The present study is part of a larger project on motivational self-regulation in secondary vocational high schools. Participants in the study were 1,920 first-year students from 11 different secondary vocational schools in the Netherlands. The Netherlands has 42 regional educational centers for secondary vocational education. They all received a letter in which we explained the purpose and relevance of the study and invited them to participate. Eleven schools responded positively. The other schools had a variety of

Table 1. *Sample characteristics*

Program type	N	% Female
ICT/Engineering	347	6.05
Retail and Administration	355	52.1
Food and Tourism	96	55.2
Health and Welfare	1122	83.2
Total	1920	62.4

reasons for not participating. The most frequent reasons were concern about the time investment of students and teachers and the extra organizational burden of participation in a large research project. The eleven schools that participated were spread evenly across the Netherlands. The students' age ranged from 15 to 55 years and 5 months with an average of 18 years and 1 month ($SD = 3.56$ years). About 18% of the participating students had an immigrant background (defined in terms of either the students' own country of origin or the country of origin of at least one of the parents). Table 1 shows the distribution of participating students by gender and program type. Most students were enrolled in health and welfare programs. More than three quarters of the health and welfare students were female. Relatively few students were enrolled in engineering and ICT and these students were predominantly male.

Instruments

Students were invited to complete several self-report questionnaires. Here, we focus on students' goal preferences, students' perception

of contextual factors in the classroom and the quality of CL. Data collection took place in the second semester of the students' first year. Table 2 presents an overview of scales, sample items and Cronbach's alphas of the different scales used in this study. Students' personal goals were assessed with the goal preference list based on the Ford (1992) and Ford and Nichols (1991) taxonomy of broad goals. Students had to report on the importance they attach to each of the goals by giving an indication of the extent to which they want to achieve them. They were asked to choose from five response categories ranging from "not at all" to "very much so". Four goal domains were highly relevant for the quality of CL: *superiority and individuality goals*, *mastery goals*, *belongingness goals* and *social support goals*.

The students' perception of the quality of CL was measured with the questionnaire for the Quality of Cooperative Learning (QCL). Originally the list comprised four subscales, namely students' perception of the quality of *group cohesion*, which was made up of seven items, Cronbach's alpha was 0.86. The second subscale measured *interdependence within the group*, and had 7 items, Cronbach's alpha was 0.83. The third subscale measured students' perception of the quality of their *cooperation skills*, this subscale was made up of 10 items and Cronbach's alpha was 0.83. The fourth subscale aimed to measure students' *attitude towards CL*, it contained 8 items and Cronbach's alpha was 0.75. These subscales were highly correlated and were all part of the quality of CL. A Principal Component Analysis on these four subscales resulted in one-factor solution. This factor had an Eigenvalue of 1.8 and it explained 58% of the total variance. Sample items were "I perceive myself as part of this group", "When we work on a group task, we make sure that all the team members understand the answers", "I know when another person needs help" and "Together you learn better than alone".

Table 2. *Categories, sample items, number of items and Cronbach's alpha coefficients*

Category	Sample item	# items	Alpha
<i>Students' goal preferences</i>			
Superiority/individuality	I want to impress others	9	0.93
Mastery	I want to learn more about my profession	6	0.92
Belongingness	I want to get along with my peers	6	0.86
Social Support	I want to help others in case they need help	7	0.91
<i>Perceived quality of CL</i>			
Quality of CL	I perceive myself as part of this group	29	0.90
<i>Conditions for CL</i>			
Task difficulty	Most group members think the task is too difficult	1	–
Task challenge	Most group members think the task is challenging	1	–
Task time	We have sufficient time for finishing the task	1	–
Task consulting	Students need to consult each other in order to finish the group task	1	–
Type of reward	After finishing the task, we receive an 1) individual reward, 2) group reward, 3) both	1	–
Cooperation skills and knowledge	At this school we learned how to have a good quality group discussion	8	0.86
Rules for CL	Before we start to work on the group task, teachers explain us how to plan	9	0.87
Teachers' monitoring behavior	Teachers walk around the classroom when we cooperate	5	0.83
Teacher interventions	If we are too noisy while we cooperate, teachers intervene	5	0.77
Teacher evaluations	After finishing the group task, teachers explain what went well during CL and what needs improvement	4	0.80
<i>Social climate</i>			
Academic support teacher	When I do not understand the lesson, I get support from my teacher	7	0.80
Academic support peers	When I do not understand the lesson the I get support from my peers	7	0.82
Social support teachers	When I am sad my teacher supports me	6	0.82
Social support peers	When I am sad my peers support me	6	0.89

Students had to indicate on a four-point Likert scale to what extent they agreed with each statement. Response categories ranged from "I disagree very strongly" to "I agree very strongly".

Students' perceptions of contextual factors in the classroom were measured with a questionnaire registering the *Conditions for CL* (CCL). This questionnaire measures students' perception of the extent that teachers create or maintain conditions for the quality of CL. Items are mainly based on reviews of studies on CL (e.g. Cohen, 1994; Webb & Palincsar, 1996). Four single items (response categories: 1 = yes, 2 = no) concerned students' perceptions of the type of task; these were about task difficulty, task challenge, the time for the task and the need to consult group members in order to finish the task. One single item concerned the type of reward students received after finishing the group task. The CCL further measured the students' evaluation of the extent that they were taught *skills and knowledge for CL* at their present schools, *rules for CL*, and *teacher behavior in relation to CL*. This latter scale consists of three subscales focusing on teachers' monitoring behavior, interventions and evaluations. Students had to report on a four-point Likert scale to what extent they agreed with each item (1 = I completely disagree, 4 = I completely agree).

Four scales derived from the Questionnaire for Social Support (Boekaerts, 1987; Vedder, Boekaerts & Seegers, 2005) measured students' *perceptions of the availability of academic and emotional support from their teachers*, and *perceptions of the availability of academic and emotional support from their peers*. Students had to indicate how often their teachers or peers provided them with emotional and academic support. Response categories (4) ranged from "almost never" to "very often".

Procedure

The questionnaires were administered during regularly scheduled lessons and the students were instructed and supervised by the researchers. Each student received a personal code, meaning that answers remained confidential. It took students two sessions of 45 minutes to complete all the questionnaires. These sessions were spread over two different days, which explains the different sample sizes. Many students failed to attend classes at both sessions. Some students simply refused to cooperate with us the second time or to fill in the entire questionnaires. The drop-out was therefore unsystematic.

RESULTS

Students' goal preferences and the quality of cooperative learning

Table 3 presents mean scores, standard deviations and correlation coefficients for the four scales of the goal questionnaire, the scales for students' perceptions of contextual factors in the classroom and the scales for students' perceptions of the social climate for the whole sample. The table shows that students were quite optimistic about the quality of the CL processes and that mastery was the most important goal domain among all students. Belongingness and social support goals were also rated as important goal domains. Superiority/individuality, however, was the least important goal domain.

We expected that students who value social and mastery goals perceive the quality of CL as high and that students who value superiority/individuality goals perceive it as low.

Results presented in Table 3 indeed show that attaching importance to both mastery and social goals relates positively to the quality of CL. Social support goals showed the highest correlation coefficient ($r(1339) = 0.33, p = 0.000$). The correlation with belongingness goals ($r(1281) = 0.23, p = 0.000$) and mastery goals ($r(1262) = 0.23, p = 0.000$) was slightly lower. Superiority/individuality goals were not significantly related to the quality of CL, although in contrast with our prediction, the correlation coefficient was not a negative one.

Students' perceptions of contextual factors and the quality of CL

Apart from a positive relationship between students' social and mastery goal preferences and the quality of CL, we also predicted that the quality of CL would be related to students' perceptions of contextual factors in the classroom, as defined by the type of task, reward systems, students' evaluations of the extent to which they were taught CL skills, teachers' clarity on rules for CL, teachers instruction behavior, and aspects of social climate. Inspection of significant correlation coefficients (above 0.20) between students' perceptions of contextual factors in the classroom revealed that students' evaluation of the extent that they were taught CL skills at their present schools was positively related to the quality of CL ($r(1465) = 0.35, p = 0.000$) and so was the students' perception of the teachers' clarity on rules for CL ($r(1416) = 0.24, p = 0.000$) and monitoring behavior ($r(1453) = 0.20, p = 0.000$). A closer look at the social climate scales showed that our expectations were confirmed. Both perceived availability of peer academic ($r(1343) = 0.28, p = 0.000$) and emotional support ($r(1336) = 0.30, p = 0.000$) were related to the quality of CL. The scales for perception of the availability of teacher support were also related to the quality of CL ($r(1327) = 0.21, p = 0.000$).

Gender differences

We expected gender and program type differences for students' goal preferences and the quality of CL. However, as explained in the Method section male and female students were not evenly distributed over the different program types. For the following analyses we excluded ICT/engineering students, because only 6% of these students were females. Table 4 shows means, standard deviations and F -values for the four goal preference subscales and the quality of CL, for male and female students separately.

Univariate analyses showed that the main gender effects concern social support ($F[1, 1340] = 35.61, p = 0.000, \eta^2 = 0.03$), superiority ($F[1, 1274] = 29.74, p = 0.000, \eta^2 = 0.02$) and mastery goals ($F[1, 1249] = 9.53, p = 0.002, \eta^2 = 0.01$). As predicted, male students' scores are significantly higher in the superiority goal domain, whereas female students show higher scores for social support goals and mastery goals. No significant differences were found for belongingness goals.

Table 3. *N*, mean scores, standard deviations and correlation coefficients of the quality of CL, goals, contextual factors, and social climate

	<i>N</i>	<i>M</i>	<i>SD</i>	Sup	Mas	Bel.	Soc	Task chall.	Task diff	Task consult	Task time	Rew	Skill	Rules	Mon	Int	Eva	T ac	T em	P ac	P em
Quality of CL (QCL)	1526	2.8	0.28	0.02	0.23**	0.23**	0.33**	-0.16**	0.10**	-0.10**	-0.06*	0.03	0.35**	0.24**	0.20**	0.19**	0.19**	0.17**	0.21**	0.28**	0.30**
Superiority (Sup)	1816	3.11	1.01		0.14**	0.26**	0.09**	-0.03	-0.08**	0.05	0.05	0.03	-0.01	0.01	0.05	0.09**	0.04	-0.01	0.05	-0.02**	-0.01**
Mastery (Mas)	1784	4.27	0.64			0.46**	0.66**	-0.07*	0.03	-0.10**	-0.08**	-0.04	0.09**	0.01	0.05*	0.02	-0.03	0.16**	0.12**	0.13**	0.17**
Belongingness (Bel.)	1821	4.15	0.68				0.49**	-0.03	0.04	-0.08	0.01	-0.07*	0.13**	0.05	0.05	0.09**	0.04	0.17**	0.17**	0.16**	0.22**
Social support (Soc)	1915	4.18	0.72					-0.04	0.04	-0.07**	-0.06*	-0.02	0.12**	0.01	0.04	0.04	-0.02	0.15**	0.15**	0.19**	0.33**
Task challenge (Task chall)	1704	1.57	0.49						0.05	0.03	-0.04	0.01	-0.18**	-0.16**	-0.18**	-0.15**	-0.19**	-0.09**	-0.10**	-0.03	0.01
Task difficulty (Task diff)	1740	1.87	0.34							-0.05	0.11**	-0.02	0.03	-0.03	0.03	0.00	0.02	0.02	0.02	0.02	0.05
Task consulting (Task consult)	1745	1.10	0.30								0.04	-0.04	-0.08**	-0.02	-0.05	0.01	0.06**	-0.03	-0.05	-0.05*	-0.07*
Task time (Task time)	1731	1.37	0.48									0.06*	-0.14**	-0.16*	-0.12*	-0.07**	-0.12**	-0.08**	-0.14**	-0.12**	-0.16**
Type of reward (Rew)	1636	1.83	0.89										0.06*	0.08**	0.05	0.03	0.03	-0.03	-0.02	-0.02	-0.00
Coop. skills (Skill)	1908	2.65	0.45											0.52**	0.34**	0.29**	0.36**	0.23**	0.23**	0.09**	0.13**
Rules for CL (Rules)	1933	2.48	0.46												0.47**	0.40**	0.52**	0.23**	0.26**	0.01	0.01
Teacher monitoring (mon)	1893	2.52	0.53													0.45**	0.50**	0.28**	0.25**	0.09**	0.08**
Teacher intervening (int)	1924	2.44	0.56														0.51**	0.22**	0.24**	0.04	0.04
Teacher evaluation (eva)	1932	2.30	0.60															0.21**	0.24**	0.04	0.00
Teacher aca support (Taca)	1951	2.8	0.63																0.62**	0.38**	0.29**
Teacher emo support (T emo)	1895	2.09	0.64																	0.31**	0.47**
Peer academic support (P ac)	1926	2.8	0.60																		0.67**
Peer emotional support (P emo)	1909	2.64	0.80																		

* $p < 0.01$, ** $p < 0.001$.

Table 4. Means and standard deviations for the goal preference subscales and the quality of CL subscale, for male (N = 402) and female (N = 1171) students

		M	SD	F	p	η^2
Mastery learning goals	Male	4.21	0.63	9.53	0.002	0.00
	Female	4.33	0.60			
Belongingness	Male	4.13	0.70	0.62	0.43	0.00
	Female	4.16	0.67			
Social support	Male	4.07	0.71	35.61	0.000	0.03
	Female	4.33	0.64			
Superiority	Male	3.30	0.99	29.74	0.000	0.02
	Female	2.93	1.03			
Quality of CL	Male	2.76	0.26	12.66	0.000	0.01
	Female	2.83	0.28			

The difference for male and female students on the quality of CL subscale is small but statistically significant ($F[1, 1207] = 12.66, p = 0.000, \eta^2 = 0.01$). Girls' scores are slightly higher than boys' scores. We examined the correlation coefficients that were significant at the $p < 0.01$ level using Fisher's z -transformations of r 's. No significant differences were found between the two samples. We conclude that gender does not moderate the relationship between students' goal preferences and the quality of CL. Next, we will investigate program type differences.

Program type differences

The influence of program type differences were analyzed for male and female students separately, because males and

females were not evenly distributed across program types. For female students we excluded comparisons that include ICT/engineering students since female students were hardly represented in this program type.

Univariate analyses showed significant effects of program type for male students in three goal domains: *social support* ($F[3, 619] 11.47, p = 0.000, \eta^2 = 0.05$), *mastery* ($F[3, 570] = 4.09, p = 0.007, \eta^2 = 0.02$) and *superiority goals* ($F[3, 588] = 4.47, p = 0.004, \eta^2 = 0.02$). The significant program type effect for female students concerned *social support* ($F[3, 1007] = 2.71, p = 0.04, \eta^2 = 0.00$). Table 5 presents means and standard deviations for the goal domains, the quality of CL subscales as well as the results of *post hoc* multiple comparison tests (Scheffé; $p < 0.05$).

As can be seen in Table 5, health and welfare male students scored significantly higher on social support goals than retail and administration and ICT/engineering male students did. This confirmed our expectation that health and welfare students, including the male students, show a preference for social support goals. Interestingly, the male health and welfare students were more mastery-oriented than their male food and tourism peers. In line with our expectations, male ICT/engineering students scored higher on superiority goals. Overall, the ICT group seemed to be a special group compared to the other groups; they had the lowest scores on social support and mastery goals. As expected, their scores differed most from the health and welfare group, who had the highest scores on most goal domains and also on the perceived quality of CL. We calculated the correlation coefficients between the quality of CL and the four goal domains within each of the four program types separately using Fisher's

Table 5. Means and standard deviations for goal preferences and the quality of CL by program type and gender

		ICT/Eng	Health	Retail	Food	Multiple comparisons (Scheffé, $p < 0.05$)	η^2
Mastery goals	Male	4.13 (0.76)	4.31 (0.57)	4.15 (0.67)	3.93 (0.67)	health > food	0.02
	Female	—	4.33 (0.60)	4.33 (0.60)	4.29 (0.61)		0.00
Social support	Male	3.81 (0.79)	4.23 (0.62)	3.93 (0.79)	3.94 (0.65)	health > ICT/ engineering, retail	0.05
	Female	—	4.33 (0.62)	4.24 (0.69)	4.38 (0.70)		0.00
Belongingness	Male	4.15 (0.73)	4.17 (0.67)	4.15 (0.73)	3.85 (0.63)		0.01
	Female	—	4.16 (0.67)	4.19 (0.64)	4.02 (0.76)		0.00
Superiority	Male	3.43 (0.80)	3.19 (1.03)	3.49 (0.93)	3.05 (0.94)		0.02
	Female	—	2.91 (1.02)	2.98 (1.09)	3.05 (1.07)		0.00
Quality of CL	Male	2.76 (0.33)	2.78 (0.24)	2.75 (0.29)	2.75 (0.22)		0.01
	Female	—	2.83 (0.27)	2.79 (0.30)	2.86 (0.22)		0.01

z-transformations of r 's in order to test the significance of these differences. Significant differences were only found for the relationship between superiority goals and the students' quality of CL. In the ICT/engineering (male) subgroup this correlation coefficient was positive ($r(186) = 0.28, p = 0.000$); in the health and welfare male subgroup no relation was found ($r(136) = -0.03, ns; Z = 2.71, p = 0.003$), and in the food male subgroup the correlation was negative ($r(31) = -0.33, p = 0.063$) ($Z = 3.09, p = 0.001$). The other correlation coefficients did not differ significantly between the program types. Since the predicted moderator effect of program type was limited to male students' superiority goal preferences and the quality of CL, we may conclude that we can hardly speak of a moderator effect of program type.

Unique contribution of goal preferences and perceptions of contextual factors to the quality of CL

In order to examine the unique contribution of each of the related goal preferences and contextual variables to the quality of CL, hierarchical regression analyses were conducted with the students' perception of the quality of CL as a dependent variable. In the first step we entered gender and program type, in the second step we entered the students' perception

of contextual factors, including their evaluations of the extent that they were taught CL skills at their present schools, their perceptions of teachers' clarity on rules for CL, monitoring behavior, perceived availability of peer academic support and peer and teacher emotional support. In the third step we entered students' goal preferences, including social support goals, belongingness goals, and mastery goals. In the fourth step, two-way "gender $\times$ goals" and "gender $\times$ context" interactions were entered and in the fifth step "program type $\times$ goals" and "program type $\times$ context" interactions were entered into the equation. The analyses did not yield significant interaction effects on step 4 and 5. Table 6 presents the results of the first three steps.

Gender significantly contributed to the explained variance in the quality of CL. However, inclusion of contextual variables in the regression equation led to the disappearance of the unique contribution of gender. Further inspection of step 2 shows that 21% of the total variance was accounted for and that all contextual factors had a unique contribution to the explained variance in the quality of CL, except for teachers' clarity on rules for CL and availability of teacher emotional support (see Table 6). When goal preferences were added in step three, 25% of the variance was explained. Hence, having information about students' goal preferences

Table 6. Summary of hierarchical regression analyses for background, contextual factors and goal preferences predicting the quality of CL

Step	Predictor	β	R^2	F
1	<i>Background</i>		0.01	5.40**
	Gender	0.09*		
	Program type	0.04		
2	<i>Background</i>		0.21	31.44***
	Gender	0.05		
	Program type	-0.03		
	<i>Perceptions of contextual factors in the classroom</i>			
	Students' evaluations of the extent that they were taught CL skills	0.24***		
	Rules for CL skills	0.07		
	Teachers' monitoring behavior	0.07*		
	<i>Perceptions of the social climate</i>			
	Perceived availability of emotional peer support	0.20***		
	Perceived availability of academic peer support	0.12**		
	Perceived availability of emotional teacher support	-0.02		
3	<i>Back ground</i>		0.25	28.67***
	Gender	0.02		
	Program type	-0.04		
	<i>Students' goal preferences</i>			
	Social support	0.20***		
	Belongingness	0.00		
	Mastery	0.03		
	<i>Perceptions of contextual factors in the classroom</i>			
	Students' evaluation of the extent that they were taught CL skills	0.23***		
	Rules for CL skills	0.07		
	Teachers' monitoring behavior	0.08**		
	<i>Perceptions of the social climate</i>			
	Perceived availability of emotional peer support	0.13**		
	Perceived availability of academic peer support	0.13***		
	Perceived availability of emotional teacher support	-0.02		

* $p < 0.05$, ** $p < 0.01$, *** $p \leq 0.001$.

explained 4% unique variance in the quality of CL and this was mainly due to the students' score on the social support goals.

DISCUSSION

First of all we explored the relationship between students' goal preferences and the quality of CL. At the outset of the study, we predicted that belongingness, social support and mastery goals would be positively related and superiority/individuality goal preferences negatively related to the quality of CL. The students in our sample gave most preference to mastery goals, followed by social support goals and belongingness goals. Social support goals had the strongest relationship with the quality of CL, again followed by mastery and belongingness goals. Students who value helping and supporting each other, rated the quality of CL higher, independent of their mastery and belongingness goals. We expected an overall negative relationship between students' superiority/individuality goals and the quality of CL. However, superiority/individuality goals were not significantly related to the quality of CL, meaning that whether students are high or low on preference for this type of goal is unrelated to their perception of the quality of CL. This unexpected finding will be discussed later in relation to the program type differences that we found.

Our second research question involved the relationship between the quality of CL and perceptions of contextual factors in the classroom, including social climate. We assumed that in order for students to cooperate well it is very important that they *know how* to cooperate in the first place. In other words, we assumed that the quality of CL will be poor when students indicate that they were not taught the necessary skills. Multiple regression analyses showed that all contextual variables made a significant contribution to the variance explained in CL, except the students' perception of available emotional teacher support and the teacher's clarity of rules for CL. Important predictors were the students' awareness that they had been taught the necessary CL skills and that their teachers were monitoring their effective use of these skills. Interesting for future research is to explore whether this relationship changes over time. As predicted, perception of social climate was related to the quality of CL. Recall, that the simple correlations showed all four social climate variables to be related to the perceived quality of CL. In the regression analyses we noted that only perceived availability of emotional and academic peer support were related to the quality of CL. It seems plausible, therefore, that the higher students rate the availability of peer support the better they will cooperate.

Thirdly, we explored gender and program type effects on the relationship between students' goal preferences and the quality of CL. Examination of gender differences in the relationship between students' goal preferences and the quality of CL revealed that, as predicted, female students showed

higher scores than male students on the quality of CL. Also in line with our expectations, female students reported higher preferences for social support and mastery goals whereas male students reported higher preferences for superiority goals. The findings suggest that female students, more than their male peers, feel confident in CL settings. These findings confirm previous findings (Eccles, 1987; Wentzel, 1991; Townsend & Hicks, 1997; Voncken *et al.*, 2000). We did not find a gender moderator effect but the study revealed interesting program type effects.

Because of their social orientation, we predicted that health and welfare students and food and tourism students score higher on the quality of CL, and on social goals, particularly in comparison with ICT and engineering students. This prediction was partially confirmed. Health and welfare students scored significantly higher on the perceived quality of CL and on social support goals than ICT/engineering students, but also higher than retail and administration students. These conclusions only pertain to male students. We explained previously that health and welfare students are preparing for a career that requires them to gain a favorable attitude toward and proficiency in social skills. We also found that health and welfare students scored significantly higher in relation to this goal domain than food and tourism students did. Another prediction was that ICT and engineering students report a higher preference for superiority goals in anticipation of their future job in the world of business. We found that these students scored higher on superiority goals than both the health and the food sub-samples and that they had the lowest scores on social support goals and mastery goals.

The program type moderator effect was limited to the relationship between superiority/individuality goal preferences and the quality of CL. In the total sample the correlation between CL and superiority goals was non-significant. A stronger correlation was noted in the male samples of the ICT/engineering subgroup as compared to the correlations in the health and welfare and food and tourism subgroups. Interestingly, the direction of the relationship differed between program types as well. In the health and welfare sample no relation was found, meaning that whether or not these students give preference to superiority goals is independent of their perception of the quality of CL. In the food and tourism sample a negative correlation was found, implying that food and tourism students, who want to impress others and outperform their peers, report that the quality of CL is lower than peers who do not have this tendency. In the ICT/engineering group, superiority goals were positively related to the quality of CL and this contradicted our predictions. However, in line with our discussion on program type dependent goal orientations it is conceivable that this dominantly male group, who scored significantly higher than the other groups on superiority goals, prefers group assignments that invite them to compete with their peers and with other groups. In this study we did not collect information on the

nature of the curriculum or the group assignments set to the students in the different program types. It might be that the group assignments set in the socially oriented program types differ from those in program types that encourage students to be more superiority minded. Several researchers (e.g., Boggiano *et al.*, 1989; Dweck, 1986) have argued that superiority goals are prevalent in traditional educational settings where competition and achievement goals are a crucial part of the learning process. More research is needed to study the underlying mechanisms of the program type effect.

Recommendations

Our main aim was to study the effect of goal preferences on CL and to identify factors that teachers can manipulate to promote successful CL and to prevent forms of mis-regulation (e.g. chatting, social loafing). Our findings to date are that the context plays a significant role in predicting the quality of CL. This is very promising. Indeed, adjustments in the context are much easier to bring about than changes in students' goal preferences. Based on our findings we are able to provide some guidelines for future interventions.

In the first place, it is important that teachers make students aware of what is required for working in a CL setting and teach the necessary and sufficient skills explicitly. More specifically, it is crucial that teachers teach their students how to listen to each other, to evaluate the group process, to discuss, to support group members, to give an opinion, or to solve group conflicts. Secondly it is important that teachers monitor the CL process, which means that they need to walk around in the classroom, frequently check with the groups and ask them how they are doing. Thirdly, teachers need to be aware that availability of peer support is essential for effective CL, emotional as well as instrumental support. This implies that teachers should not only encourage students to provide this type of support but also encourage them to role-play this type of behavior.

The role of the teacher in providing support was less important than peer support. However, this could be an artifact of the type of analyses that we conducted; several other variables in the analyses referred to teacher behavior and these variables explained a large portion of the variance in CL.

Finally, we want to remark that the relatively weak link between student goal preferences and the quality of CL may be due to the fact that not all students are aware of the multiple goals they pursue in the classroom and of the relationships between their multiple goals and aspects of CL. Currently we are conducting a follow-up stimulated-recall study where we assess the significance that students attach to different types of goals while working on specific tasks in a CL setting. After their group working sessions, groups of students are invited to provide information about their goal preferences and their actual perception of the quality of CL. Preliminary findings indicate that students do not spontane-

ously reflect on the link between their goal preferences and the quality of CL. Discussing personal goals in order to make students aware of the role these goals play in the learning process might be an important step towards more successful CL. Teachers need to invite their students to think about their own goals and about the links between personal goals and the goals presented to them by teachers, course books, and other students. Such reflection might help them to adopt teacher-set learning goals and self-regulate their learning more efficiently (see Boekaerts & Corno, 2005). Also, teachers need to create a classroom environment where peer support is promoted and valued. At the same time, this type of environment will stimulate students to pursue their social support goals, which are also crucial for successful CL.

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