Original article

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Cross-age peer tutors in asynchronous discussion groups: studying the impact of tutors labelling their interventions

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Abstract Cross-age tutors were randomly assigned to one of the three tutor training conditions distinguished for the current study: (1) the labelling experimental condition, characterized by requirements to label their tutor interventions, based on the e-moderating model of Salmon; (2) the non-labelling experimental condition, focusing on tutor's acting upon the role of an e-moderator without preliminary requirements with regard to labelling the phase of e-moderating in their messages; and (3) a control condition, typified by all-round information on online facilitation. The results indicated that tutors are not really capable in labelling their interventions accurately. Nevertheless, labelling did foster enhanced e-moderating activities. Compared to tutors in the control condition, tutors in the experimental conditions performed at a higher level, implying that they adopted more balanced tutor support. Labelling did not result in a differential impact on self-efficacy and perceived collective efficacy.

Keywords efficacy beliefs, labelling, peer tutoring, scripting, tutor training.

Introduction

In the present study, cross-age peer tutoring was introduced in asynchronous discussion groups to support freshmen discussing authentic problems. Fourth-year students were involved as tutors to provide structure and to scaffold collaborative learning in a computer-supported collaborative learning environment (CSCL).

Prior research, examining the nature of the actual tutor support, revealed that peer tutors were mainly engaged in social support, and paid less attention to stimulating 'knowledge construction' and 'personal development' (De Smet *et al*. 2008). According to Salmon (2000), online tutor support should embrace a wider variety of e-moderating activities, ranging from support for 'access and motivation' to 'socialization', 'information-exchange', 'knowledge construction' and 'personal development'. Therefore, both the design and content-focus of tutor training were stated as critical variables to be considered in future research (De Smet *et al*. 2008).

Taking the above mentioned results into account, the main aim of the present study was to improve and balance the nature of peer tutor interventions by fostering self-monitoring. As suggested by Zimmerman and Paulsen (1995, in Ellis and Zimmerman (2001, p. 210), 'during high-quality self-monitoring people track or control their understanding and performance'. According to Chang (2007), applying a self-monitoring strategy is strongly recommended for Web-based instruction. In the present study, self-monitoring was invoked by inviting online peer tutors to label their interventions. In particular, three different tutor training approaches – in which one particular group of tutors

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was invited to label their tutor interventions based on the e-moderating model of Salmon (2000) – were distinguished. Considering the expected impact of labelling on the nature of tutoring activities, we initially studied the nature and the accuracy of the labelling. The different types of tutor training were considered as the independent variables in this study. As dependent variables we studied the impact on the types of tutoring behaviour in terms of e-moderating (Salmon 2000) and the impact on self-efficacy (Bandura 1993; Ellis & Zimmerman 2001) and collective efficacy beliefs (Sosik *et al*. 1998; Carroll & Reese 2003). This specific focus on efficacy beliefs is in line with the work of Brown and Morrissey (2004) building on the idea that specific training approaches can have a differential impact on tutor characteristics that are related to one's motivation to perform in accordance with the training guidelines (Nijman 2004).

Theoretical framework

Facilitating and scripting

CSCL has become more prevalent in higher education. A key issue in the CSCL literature is how to facilitate learner activities in CSCL settings. It has repeatedly been argued that collaboration as such does not systematically produce learning (Dillenbourg 2002). The current CSCL debate, therefore, focuses on the conditions that foster productive interactions (McLoughlin & Luca 2000). Dewiyanti *et al*. (2005) stress that successful implementation of a CSCL environment is determined by instructional methods within the learning environment. These instructional approaches are expected to answer the need for guidance of learners in meaningful online discourse (Laurillard 1998; Bonk *et al*. 2004; De Smet *et al*. 2008). Two dominant instructional approaches can be observed. A growing body of empirical studies focuses on the supportive task and role of facilitators in a CSCL context (Garrison *et al*. 2000; Salmon 2000; Bonk *et al*. 2004; Rickard 2004). Other researchers (Dillenbourg 2002; Weinberger *et al*. 2005; De Wever *et al*. in press) focus on scripting. Typical scripts assign task-based or communication-oriented roles to learners in order to aim for critical thinking and knowledge construction (De Wever *et al*. in press). Other scripts present detailed guidelines or work plans to the collaborating learners (Weinberger *et al*. 2005).

Peer tutors as online facilitators

In the present study, we involved peer tutors to take up the role of 'online facilitators' (Backroad Connections Pty Ltd. 2002; Rickard 2004). In particular, cross-age peer tutoring was introduced into asynchronous discussion groups. Peer tutoring can be defined as 'people from similar social groupings who are not professional teachers, helping each other to learn and learning themselves by teaching' (Topping 1996, p. 322). According to Verba (1998), peer tutoring is one way of making an active and social constructivist contribution to knowledge acquisition. A more capable peer with a supportive role is called the 'tutor', whereas less experienced students receiving help from a tutor are called 'tutees' (Topping 1998). In the CSCL environment peer tutors facilitate the online communication to foster collaboration, and to structure, moderate and improve the learning of the tutees.

Labelling as a scripting approach

In view of improving tutors' online facilitation acts, part of the peer tutors involved in the present study was required to identify the type of each contribution they add to the discussion. This labelling activity – also called *tagging* – is a particular type of scripting. Our interest in using scripts to improve and balance one's supportive efforts is inspired by the work of De Bono (1991). He described the positive effects of labelling one's point of view underlying decision-making processes in collaborative learning.

In our study, a number of tutors are invited to base their labelling on the e-moderating model of Salmon (2000). Her research identified five stages in e-moderation, each focusing on the development of consecutively more complex e-moderating skills and specific technical skills. At stage one 'access and motivation', the e-moderator supports individual access and the ability of participants to use computer-mediated communication. At stage two 'online socialization', individual participants have to be fostered to establish their online identities and to find others to interact with. At stage three 'information-exchange', participants are stimulated to exchange information relevant to the course and in view of shared goals. At stage four 'knowledge construction', course-related group discussions are stimulated and shared understanding becomes established. At stage five 'development', individual

reflection on the actual learning process has to be supported.

In addition to linking their tutoring intentions to a shared framework, the participants were required to decide themselves what type of support is most relevant to bring in for approaching tutees' needs. This might invoke higher-order thinking and self-monitoring as labelling involves a relatively complex judgment task. According to Halpern (1998), higher-order thinking is thinking that is reflective, sensitive to context and self-monitored. Ellis and Zimmerman (2001) stated that this self-monitoring process results in a stronger focus and enhanced (meta)cognitive awareness. This can also be linked to the work of Bandura (1993) when he discussed the concept of cognitive motivation that helps translating forethought and goal setting into anticipatory action through self-regulatory mechanisms. Recently Ickes *et al*. (2006) examined the role of self-monitoring in social interaction. Besides noting that high self-monitors easily adapt to new social contexts, they found that high self-monitors strongly express positive affect in their relations with others.

Labelling requirements and efficacy beliefs

In line with the finding that self-efficacy positively contributes to self-regulatory cognitive functioning (Bandura 1993), Chang (2007) argues that self-monitoring strategies – such as labelling – might enhance students' self-efficacy beliefs. Furthermore, since learning in a peer tutoring setting is to be considered as a specific type of collaborative learning (Topping 1996; Griffin & Griffin 1998), next to personal beliefs, tutors' perceived collective efficacy might also be influenced by labelling requirements. Scripts or structuring tools can specify, sequence and assign collaborative learning activities in online learning environments (Kollar *et al*. 2003). In this respect, we assume that labelling might also have its influence on tutors' beliefs on the group's collective power to produce desired results, here described as perceived collective efficacy. Collective efficacy is a fairly new concept, finding its origins in the theory of self-efficacy. As Bandura (1997) suggests, collective efficacy refers to the self-efficacy of a group, team or larger social system or entity. In recent research, Bandura (2000) reported that perceived collective efficacy is an important contributor to human agency.

In this study, we did not focus on the effects of efficacy beliefs on specific behaviour (Bandura 1993; Michalski & Cousins 2000; Pajares 2004). We also did not investigate the effects of peer tutoring on academic self-efficacy (Griffin & Griffin 1998). The present study rather controlled for the impact of different training conditions on peer tutors' self-efficacy and perceived collective efficacy. Therefore, the central question was not whether or not training will increase one's efficacy beliefs, but whether different training approaches make a difference. This idea builds on the dissertation of Nijman (2004) regarding the interaction between specific training approaches and resulting trainee characteristics in professional organizations. It also follows the empirical work of Brown and Morrissey (2004) exploring the effects of different training conditions on undergraduate students' self-efficacy. The three different tutor training conditions as developed and implemented in the present study (e.g. labelling, non-labelling, control) are described in the following section.

Research objective and questions

The central research objective of this study focuses on the differential impact of tutor training approaches and the impact of labelling during tutoring activities on: (1) actual tutoring behaviour in terms of e-moderating; (2) tutors' self-efficacy beliefs; and (3) tutors' perceived collective efficacy. Three specific research questions are put forward:

- Did the tutors in the labelling training condition, label their interventions in an accurate way?
- Do the labelling requirements result in different patterns in e-moderating compared to a non-labelling tutor training and a control condition?
- Does labelling have a differential impact on tutors' self-efficacy beliefs and perceived collective efficacy?

Method

Participants and setting

The study was set up in a naturalistic university setting involving 74 online peer tutors supporting about ten freshmen each in asynchronous online discussion groups. The majority of the peer tutors (80%) were

female, aged between 22 and 24 years. The discussion groups were a formal part of the course 'Instructional Sciences' for first-year bachelor students taking the 'Educational Sciences' curriculum. Tutors were fourth-year 'Educational Sciences' students, taking up the tutor role as a formal part of their six-credit educational internship. Both tutors and tutees represented the entire population of fourth- and first-year students.

Procedure

Tutor training

Tutors received a 3-h tutor training consisting of a face-to-face session two weeks before the onset of the discussion groups. In the experimental conditions, 35 tutors were introduced to the multidimensional nature of tutoring (Rickard 2004). These tutors received a theoretical introduction to the five-step model for e-moderating of Salmon (2000). Additionally, the 35 tutors were randomly assigned to a labelling and a non-labelling experimental condition.

Tutors in the labelling condition ($N = 18$) were trained in labelling their distinct tutor postings as one of the five e-moderating steps. This aims to stimulate reflection upon the ongoing discussion and on how to intervene in order to improve collaboration. Moreover, labelling visualizes the predominance or absence of one or more e-moderating steps. In this respect, tutors are stimulated to self-monitor and reflect on their own interventions.

In the non-labelling condition ($N = 17$), cross-age peer tutors were introduced in identical online group discussions without preliminary requirements with regard to labelling the phase of e-moderating in their messages. In a next phase, all peer tutors in the experimental conditions were invited to study the output of CSCL activities of an earlier student cohort, also supported by tutors. This helped to discuss content mistakes, conflicts, unclear arguments and tutees' non-participation in the discussion group and how they could react as tutors. The training ended by a hands-on introduction to the technical CSCL environment and a detailed introduction with regard to the planning and set-up of the course (e.g. internship rules, group composition, planning, etc.). This extra information was also made available – for future consultation – on a tutor website. Tutors could also consult a printed manual with all background information.

Next to the two experimental training conditions (e.g. labelling and non-labelling), a control condition consisting of online peer tutors from an earlier tutor cohort was part of the research design. Tutors in this control condition ($N = 39$) were involved in a comparable internship but did only receive all-round tutoring instructions about online facilitation (Backroad Connections Pty Ltd. 2002; Rickard 2004). These tutors were informed about skills such as community building, asking questions, triggering reflection and providing feedback (De Smet *et al*. 2008). Also an information website and a manual were made available. Compared with the training of tutors in the experimental conditions, the training in the control condition was theoretical in nature. For example, tutors did not exercise their tutoring interventions and no trial discussions with peer tutors were organized.

Group assignments

For 8 weeks, the tutors supported the collaborative work in relation to four educational themes. Each theme presented an authentic group assignment, related to a chapter of the course: behaviourism, cognitivism, constructivism and higher-order thinking. The online discussion to work on the assignment lasted for 2 weeks. The assignments were identical for all discussion groups and can be characterized as open-ended tasks, implying no standard approach, nor resulting in single right answers. Furthermore, the assignments were quite complex and extensive in order to force group members to join efforts. For analysis purposes, the four discussion themes were clustered in two tutoring phases to study tutoring activities and self-efficacy at the start (themes 1 and 2) and at the end (themes 3 and 4) of the peer tutoring activities.

Research instruments

Tutors in both the labelling and non-labelling conditions were invited to complete two self-report questionnaires to measure their self-efficacy beliefs and perceived collective efficacy. The ten-item self-efficacy instrument building on the Teachers' Sense of Efficacy Scale prescribed by Tschannen-Moran and Woolfolk Hoy (2001) and the Teacher Self-Efficacy Scale of Bandura (2006) was administered at the start and during the closing phase of the discussion activities. Reliability of the self-efficacy instrument is 'acceptable' to 'good'

with α coefficients varying between 0.65 and 0.82. The collective efficacy instrument based on the group potency scale of Guzzo *et al*. (1993) was administered after finalizing the assignment in each discussion theme. An acceptable internal consistency (Cronbach α = 0.74) was found.

Data collection and analysis

In view of determining the impact of three different training approaches on the nature of tutoring behaviour, content analysis was applied to analyse the complete dataset of tutor transcripts generated during the asynchronous discussions. Additionally, the number of tutor posts was counted to measure participation per tutor per tutor training condition and per tutoring phase.

The 'unit of meaning' in a tutor message was chosen as the unit of analysis. Following Chi (1997), a unit of meaning is a unit that represents a consistent idea, argument chain or discussion topic. Each unit of meaning was coded on the base of Salmon's (2000) taxonomical model for e-moderating. As reported in a previous study (De Smet *et al*. 2008), 17 categories – representing the five stages – were distinguished as operational indicators of online tutoring support. We more specifically focused on the occurrence of five e-moderating activities during tutoring, going from fostering access and motivation, over encouraging socialization, information-exchange and knowledge construction, to stimulating personal development.

Segmentation into units of meaning and coding was performed by independent trained coders. During a 3-h face-to-face training session the coders received: (1) an explanation of the segmentation and coding process; (2) written guidelines elucidating the segmentation and coding procedure; (3) authentic examples illustrating each code; and (4) a practice session based on sample data. As suggested by Strijbos *et al*. (2006), a procedural distinction was made between the segmentation process into units of analysis and the coding process.

To determine inter-rater reliability, a sample consisting of 371 units of meaning (7%) was coded by both coders. A moderate Cohen's kappa (0.66) was calculated indicating an acceptable level of agreement between coders beyond chance. When Cohen's kappa is used, values between 0.40 and 0.75 represent fair to good agreement beyond chance (Neuendorf 2002).

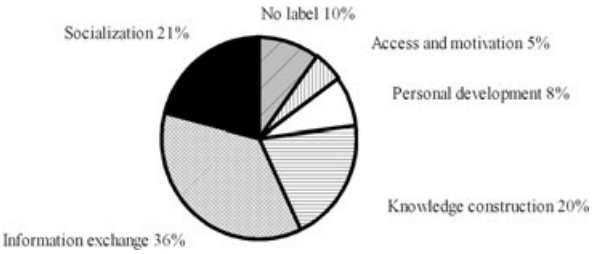

Fig 1 An overview of the actual labelling performance of tutors assigned to the labelling condition (*N* = 18).

Results

Tutor participation

The work of the 35 experimental tutors resulted in 2591 messages, consisting of 5381 units of meaning. Tutors in the labelling condition (*N* = 18) submitted 1442 messages, which are 80.11 messages per tutor. Tutors in the non-labelling condition (*N* = 17) posted only 1149 messages, which are 67.59 messages per tutor. Less postings were counted in the closing phase (themes 3 and 4) with an average of 31.26 messages per tutor, as compared with the starting tutoring phase (themes 1 and 2) with an average of 42.77 messages per tutor.

According to the statistical analyses, there is a significant decrease in tutor messages over time ($t = 5.906$, d.f. = 34, $P = 0.000$). A differential impact of the tutor training condition was found as well. During the starting phase, a significantly higher amount of messages were posted in the labelling condition (mean = 49.06 messages per tutor) than in the non-labelling condition (mean = 36.12 messages per tutor); $t = 2.160$, d.f. = 33, $P = 0.038$.

Did the tutors in the labelling condition, label their interventions in an accurate way?

89.7% of the messages of peer tutors in the labelling condition were labelled related to Salmon's five-step model. For the remaining messages, tutors did not perform the labelling. Figure 1 presents an overview of the actual labelling performance along the five steps of e-moderating for tutors assigned to the labelling condition. In 57.9% of the contributions, the label tagged to the message was associated with at least one of the codes assigned to the unit(s) of meaning in that message. More specifically, it appeared that the tutor message label generally corresponded to the code assigned to the unit of meaning consisting of the highest

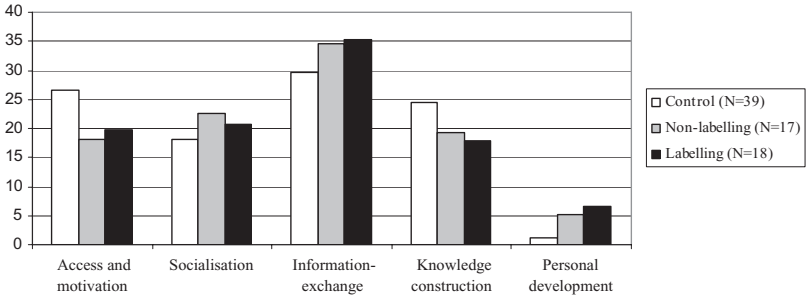

Fig 2 Percentages of Salmon's five-step model for e-moderation per tutor training condition.

amount of words. When exploring the fit between the message label and the objective coding for each distinct unit, it appeared that in only 34.6% of the 2754 involved units of meaning full correspondence was found. Full correspondence means that the label per unit is identical to the code per unit. To deal with the methodological difficulty that tutors assigned one of the five labels to complete messages whereas independent coders assigned one of the five codes to units of meaning within messages, all units of meaning were labelled in accordance with the tutor's label per message. In view of exploring the occurrence of full correspondence between the tutors' labels and the independent coder's code, for instance, in the case that a tutor tagged his complete message as 'information-exchange' we labelled the unit(s) in that message similarly.

To analyse the labelling approach of the tutors, a more detailed comparison was carried out by comparing the labelling and the coding by independent coders, resulting in an indicator for accurate labelling (label = code) with regard to each step of e-moderating. 'Access and motivation' and 'information-exchange' appeared to be the least problematic to be labelled. In respectively 56.6% and 40.0% of the units of meaning assigned to these phases of e-moderating the tutor labelling per message (i.e. per unit) was identical to the objective coding of the unit(s) per tutor message. Considering 'socialization', 'knowledge construction' and 'personal development', the percentages reflecting labelling accuracy were 37.9%, 25.2% and barely 12.2%, respectively.

Do the labelling requirements result in different patterns in e-moderating compared with a non-labelling tutor training and control condition?

In view of answering this research question, the data of tutors in the two experimental and the control condition are taken into account. The following results refer to the patterns in e-moderating of 74 tutors assigned to either the labelling ($N = 18$), non-labelling ($N = 17$) or control training condition ($N = 39$). The objective coding of the tutor interventions according to the model of Salmon is the basis for this analysis. The percentages in Fig 2 indicate the proportions of particular tutoring behaviour of tutors in the three different conditions. The descriptive results indicated that tutors in the labelling condition reflect a higher proportion of e-moderating interventions stimulating 'personal development'. Nevertheless, the overall pattern in e-moderating does not seem to be very different between the tutors in the different conditions. All tutors dominantly give tutor support that invokes 'information-exchange'.

In order to explore the impact of labelling on tutoring patterns in more detail, a multinomial logistic regression analysis was performed with the five categories of the five-step model for e-moderating as polytomous dependent variable, and the three training conditions as independent variable. Multinomial logistic regression is used when the dependent variable in question is nominal and consists of more than two categories (Hosmer & Lemeshow 2000). As can be derived from Table 1, the tutoring category 'access and motivation' was chosen as reference category for the multinomial logistic regression analysis. The control condition was selected as reference category to study the impact of the training conditions. A total of 10.853 units of meaning were analysed and the full model significantly fitted with the data [χ^2 (8) = 355.215, $P < 0.000$]. Table 1 summarizes the regression coefficients, Wald statistics, associated degrees of freedom and probability values for the independent variable. The results indicate that the training condition reliably affected tutoring behaviour in terms of e-moderating. A number of significant differences are related to tutors in the labelling condition. When comparing e-moderating in the

Table 1. Multinomial logistic regression estimates indicating the differences between the training conditions with regard to performing a particular tutoring behaviour following the model of e-moderating.

Phase e-moderating	Training condition	Est.	Std. error	Wald	d.f.	Sig.	OR	LB95 %CI	UB95 %CI
Socialization[1]	Intercept	–0.388	0.041	88.770	1	0.000			
	Labelling	0.432	0.070	37.690	1	0.000	1.540	1.342	1.768
	Non-labelling	0.604	0.077	61.183	1	0.000	1.829	1.572	2.128
	Control	ref.cat							
Information-exchange[1]	Intercept	0.106	0.036	8.621	1	0.003			
	Labelling	0.475	0.062	57.782	1	0.000	1.607	1.422	1.817
	Non-labelling	0.541	0.070	59.853	1	0.000	1.718	1.498	1.971
	Control	ref.cat							
Knowledge construction[1]	Intercept	–0.087	0.038	5.235	1	0.022			
	Labelling	–0.017	0.070	0.056	1	0.812	0.983	0.857	1.129
	Non-labelling	0.146	0.078	3.551	1	0.059	1.157	0.994	1.347
	Control	ref.cat							
Personal development[1]	Intercept	–3.080	0.125	607.715	1	0.000			
	Labelling	2.000	0.149	180.304	1	0.000	7.386	5.517	9.890
	Non-labelling	1.834	0.162	128.603	1	0.000	6.261	4.560	8.597
	Control	ref.cat							

[1]The reference category is 'Access and motivation'.
Est, estimated parameters; Std., standard error; d.f., degrees of freedom; Sig., significance; OR, odds ratio; LB95, lower bound; CI, confidence interval.

labelling condition with the control condition, we come to the following conclusions: the odds of focusing on 'socialization', 'information exchange' and 'personal development' versus 'access and motivation' are 1.54, 1.61 and 7.39 times higher, respectively. When comparing e-moderating in the non-labelling condition with the control condition, the following results emerge: the odds of focusing on 'socialization', 'information-exchange' and 'personal development' versus 'access and motivation' are 1.83, 1.72 and 6.26 times higher, respectively. When comparing e-moderating in the labelling condition with the non-labelling condition, no significant differences were found.

Does labelling have a differential impact on self-efficacy beliefs and perceived collective efficacy?

With regard to the third research question, statistical analyses are based on the comparison of mean test scores of tutors in the labelling ($N = 18$) and non-labelling condition ($N = 17$). The control condition was not taken into account since the instruments were not administered to these tutors.

It is first to be noted that tutors' overall self-efficacy beliefs were fairly high (mean = 2.43). Second, no significant differences at the 5% level were found between self-efficacy beliefs of tutors in both experimental training conditions. However, significant differences in perceived collective efficacy could be observed ($t = -2.101$, d.f. $= 33$, $P = 0.043$). This represented a higher perceived collective efficacy in the non-labelling condition (mean = 2.45) compared with the labelling condition (mean = 2.08). Third, in both training conditions tutors' perceived collective efficacy did increase over time. A paired *t*-test showed a significant increase in tutors' perceived collective efficacy over time ($t = -7.251$, d.f. $= 34$, $P = 0.000$).

Discussion

Building on prior research (De Smet *et al*. 2008), the present study tried to enhance the work of cross-age tutors in online asynchronous discussions. Next to a more elaborated tutor training, part of the tutors was invited to label their tutor interventions.

Tutor participation

The results clearly show that tutors in the labelling condition intervened more frequently than other tutors.

Other researchers have stressed that the quantity of participation in a text-based CSCL environment, is an important predictor for future knowledge construction (Weinberger & Fischer 2006; Schellens *et al*. 2007). We can argue that working with the labels did offer tutors an efficient thinking tool that fostered an initial higher degree of active tutoring.

Labelling performance

The first aim of this study was to control the actual labelling performance of cross-age peer tutors. A first observation is the high percentage of labelling that did take place. Secondly, it was found that about 58% of the labels were in agreement with at least one of the codes given by independent coders to the unit(s) of meaning in tutor messages. It therefore appeared that tutors included in a single message other information apart from the label reference as well. This observation implies that tutors adopted different types of e-moderating in a single message. Part of the message was therefore not correctly labelled. An example is that tutors blend 'welcoming and motivating' with 'providing extra information'. A typical tutor would label this message as 'information-exchange'. This exemplifies that labelling is not a straightforward cognitive task.

The results in relation to the first research question also point at a large number of inaccurate labels; tutor labels linked to their messages were not always identical to the labelling by independent coders. At this moment, there is hardly comparable research evidence available to compare the results of the present study. Nevertheless, the results can be explained in a number of ways. First, the results are in line with Robinson and Udall's (2006, p. 98) report about self-assessment. They state that 'students are often unable to make realistic judgments about their own learning'. However, and in accordance with De Bono's (1991) view that labelling can help learners becoming better self-monitoring thinkers, it is likely that labelling could have a positive impact on tutors' thought processes despite the weak agreement between tutor labels and the objective coding. Second, the findings can suggest that the fourth-year tutors lacked sufficient experience with the e-moderating framework. Furthermore, since they had to perform this task or script on top of the actual tutoring work, this might have invoked a level of undesirable extraneous cognitive load (Dillenbourg 2002; Kirschner 2002; Koedinger & Aleven 2007). Salmon (2006) gives in this context advice to avoid e-moderating barriers during actual tutoring activities. Finally, the taxonomical structure of the e-moderating model might have suggested tutors to strive after tutoring behaviour that was actually beyond tutees' needs and the required kind of tutoring at hand. In the literature this is referred to as the 'demand effect', a concept adopted by Grant (2003).

The findings in relation to the first research question suggest that future practice and research should aim at a longer and more detailed introduction about the nature of the e-moderating labels. Since labelling implies thinking, we agree with Halpern (1998) who states that thinking skills need to be explicitly and consciously taught and exercised. In this respect, novice peer tutors might benefit from a trajectory of engagement with self-monitoring strategies which could gradually induct them into the use of labels.

E-moderating

The results indicate that, independent of the nature of the tutor training, tutors fulfilled all of the roles expected in e-moderating activities: motivational, social, informative, knowledge constructive and challenging for personal development (Salmon 2000). These results reiterate the findings from our previous study in a similar research context (De Smet *et al*. 2008). Exchanging information remains, however, a dominant type of tutoring behaviour and this in contrast to the limited occurrence of the fifth and highest step in e-moderating. This suggests that tutors still mainly centre on informing and modelling. Nevertheless, on the base of multinomial logistic regression analyses, the three different tutor training conditions seem to result in significant differences in the e-moderating patterns as well. Both the labelling and non-labelling conditions are associated with an increase in support for 'socialization', information-exchange' and 'personal development'. Tutors in the labelling condition seem to foster 'personal development' to the highest extent. Tutors in the non-labelling condition surpassed the labelling tutors with regard to the occurrence of 'socialization' and 'information-exchange'.

The small differences between the tutors in the labelling and non-labelling experimental condition are surprising. The findings suggest not to magnify the

extent to which a specific tutor training affects online peer tutoring behaviour in the early stages of tutoring. It even seems that a strong focus on labelling and hence on deliberate self-monitoring as part of a tutor training and tutoring activity might be – initially – counter-productive. This is a phenomenon regularly observed in research on variables affecting 'transfer of training' (Prawat 1989; Ottoson 1997; Nijman 2004). A positive impact of labelling might occur only at a later stage when the interference of the labelling is no longer obstructing the actual tutoring process. Further research is needed to study this assumption on cognitive load during labelling. Although the results suggest that tutors in the experimental conditions adopt a wider range of e-moderating activities, future research should also explore the underlying reasons for the increase in support generating 'socialization', 'information-exchange' and 'personal development'. Qualitative studies building on stimulated-recall and focus groups could be helpful to gather this type of tutor information.

Efficacy beliefs

The third purpose of this study was to examine the impact of labelling on self-efficacy beliefs and perceived collective efficacy. In the context of this research, perceived self-efficacy was related to peer tutors' prospective action in the role of online facilitator whereas perceived collective efficacy was related to tutor's perceptions with regard to the interpersonal characteristics of tutees' online discussion behaviour in small groups.

The findings showed that tutors' self-efficacy beliefs were high but no differences were found between the labelling and the non-labelling tutor training condition. This suggests that labelling tutoring activities did not invoke self-monitoring activities to a higher extent, leading to higher self-efficacy beliefs, as proposed by Chang (2007). Similarly, this result does not substantiate the findings of Brown and Morrissey (2004) illuminating that verbal self-guidance training increases students' self-efficacy beliefs.

Significant differences in perceived collective efficacy were observed between tutors in the two training conditions at the start of the tutoring activities. The differences between the two conditions with regard to tutors' perceived collective efficacy could not be replicated during the closing tutoring phase. The results suggest that tutors in the labelling condition initially experienced a lower level of perceived collective efficacy. This particular finding fits on the one hand into the earlier observations about the lack of a strong differential impact of labelling on the nature of online tutoring in terms of e-moderating. On the other hand, this hypothesis fits in with the work of Bandura (2000), who states that the extent to which one puts effort in the group endeavour is affected by perceived collective efficacy, and the other way round. Because of the labelling, tutors might consider in more detail how well or how bad tutees work together, thus affecting their overall perceived collective efficacy. This confirms the assumption that labelling helps them in becoming more critical thinkers as suggested by De Bono (1991). Moreover, this finding supports the idea that self-monitoring strategies can improve students' adaptive goal setting and self-regulation (Ellis & Zimmerman 2001; Chang 2007).

Limitations and further research

The present study reflects a number of shortcomings that should be considered when interpreting the findings. Furthermore, the limitations are to be addressed in future research.

Our research clearly is limited to the study of the online tutor. This particular focus on the tutor neglects the complex interplay between tutors and tutees. This can result in the critique that tutor activities are too much studied in isolation and independent from tutee activities. However, we agree that there is an important interaction process between tutor and tutees.

The interpretation of the present research findings is also limited because of the lack of comparable studies about online peer tutoring. This type of empirical studies is scarce. Some exceptions are the computer-supported peer tutoring studies of De Smet *et al.* (2008) and McLuckie and Topping (2004), and studies illustrating a practical and comprehensive model for a peer tutoring skills training (Chappell 1995; Nath & Ross 2001).

In addition to the content analysis and logistic regression techniques used in this study, other techniques should be adopted to acquire a fuller understanding of cross-age tutoring activities. Data and method triangulation should be adopted. For example, stimulated-recall interviews (Calderhead 1981; Lyle 2003) could be a promising direction to explore the thoughts underlying tutors' contributions, and this related to the labelling activities and their efficacy beliefs.

To explain the lack of significant differences in tutor-related dependent variables, other issues should be considered. The present study was set up in a naturalistic setting. It was therefore not possible to rule out external factors influencing the tutor training effectiveness in terms of 'transfer' (Prawat 1989; Ottoson 1997). Future research could take a closer look at tutors' (labelling) performance and relate this activity to their degree of flexibility to adopt a certain phase of e-moderating on a certain moment and learning outcomes in the long run. In the discussion section, it was suggested that cognitive load might have played a role. This variable could be studied and/or controlled for in future research.

Conclusion

The present study about facilitation via peer tutoring and labelling of tutoring activities has resulted in a number of useful observations about the nature and structure in peer tutoring in a CSCL setting. The study results indicate that tutors easily adopt labelling activities, but that their labelling is not always accurate. Nevertheless, the labelling activity combined with a more extensive tutor training, proved to result in a number of significant differences in the occurrence of particular types of tutoring activities and a more balanced pattern in the types of tutoring activities. However, the results are still too unclear to be able to observe differential patterns in e-moderating because of the labelling activity. Finally, the research results indicate that the labelling activity has – yet – hardly a differential impact on self-efficacy. Differences in perceived collective efficacy can be observed, suggesting that the labelling activity imposes extra workload on tutors. The discussion of the research results points at the need for qualitative research that pays even more attention to the initial tutor training and the long-term impact on their tutoring activities.

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