Summary

In 2008, Leiden University initiated the Taskforce Study Success, whose primary aim was to provide recommendations for increasing study success and decreasing student attrition across bachelor programs. Within the context of the Taskforce's (2009) broader set of recommendations, this thesis focused on the design of formative peer feedback on academic writing tasks and the effects thereof on students' performance. In particular, this thesis investigated to what extent formative peer feedback impacts higher education students' academic writing performance and how particular aspects of peer feedback task-design affect this performance. This thesis aimed to combine both theoretical and practical significance. To advance scientific knowledge, a quantitative focus on students' academic writing performance was combined with relatively well-controlled research designs in authentic educational contexts. To be of practical value for higher education teaching staff, this thesis focused on aspects of peer feedback task-design that were perceived as relatively controllable for higher education teachers.

Five studies were conducted. In chapter two, a meta-analysis was reported to assess the impact of formative peer feedback on higher education students' academic writing performance. Results indicated that the effects of formative peer feedback on academic writing performance tend to be larger than that of either no feedback or self-assessment, whereas the effects of peer- and teacher feedback appeared to be similar. In addition, two moderator analyses were conducted to investigate the role of two controllable aspects of peer feedback task-design: the nature of peer feedback and the number of peers engaged with during peer feedback. The results of these analyses indicated that a combination of both peer comments and –scores tends to have a larger effect on writing performance than either peer comments or –scores alone, whereas the number of peers with whom a student engaged during peer feedback did not moderate subsequent writing performance. These results suggest that higher education teaching staff can be confident that peer feedback positively affects their students'

learning gains, and indicate that they should design their peer feedback tasks in such a way that students provide both comments and scores to each other's writing. A notable limitation of this study concerned the small ($N = 24$) number of studies that proved eligible for inclusion. It was argued that this signals a need for more well-controlled, (quasi-)experimental studies.

In chapters three and four, two empirical studies were reported that focused on the effects of students' ability-match. Chapter three described a quasi-experimental study in which 94 students were anonymously matched into either same-ability (homogeneous) or different-ability (heterogeneous) dyads. Dyad composition appeared unrelated to the nature of the peer feedback or subsequent improvements in writing performance, although a trend was found suggesting that high-ability dyads focus more on content-related issues. Also, relatively high- or low ability authors did not differ in how they benefitted from peer feedback on aspects of essay content-, structure-, or writing style. If confirmed by future studies, these results suggest that higher education teaching staff should not worry too much about students' ability match during peer feedback on writing tasks. However, ability differences in this sample could have reflected between-student differences within a sample that – overall – was relatively similar in this respect. As a consequence, the reported effects of ability matching may reflect conservative estimates and therefore may be more profound in situations where ability differences are larger. Therefore, chapter four explored the effects of ability matching on writing performance in the context of a massive open online course (MOOC). A total of 565 participants were categorized as highest (42%), intermediate (45%) or lowest (13%) performers based on available performance metrics prior to the first of two essay assignments. Post hoc analyses were conducted to explore the relation between participants' own performance level, that of their reviewing peers', and participants' writing performance increase between the first and second essay. Overall, peer assessor's average performance level positively related to participants' increase in writing performance. More specifically, peer assessors' average performance level only related to the writing performance of the intermediate and higher performing participants, and not to that of the lowest performing participants. Effect sizes were small,

however. Different explanations were considered conceivable, including that performance level relates to participants' ability to utilize the received peer feedback or that performance level relates to variations in the peer feedback quality that assessors provide. Given the exploratory nature of this study, these findings and explanations are to be tested by future studies that, among others, include more background info on participants such as educational background and individual learning goals.

Chapter five reported on an empirical study that compared the impact of providing versus receiving peer feedback on students' academic writing performance. In addition, this study investigated how the nature of the peer feedback that students received related to their peer feedback perceptions and their writing performance. Results indicated that peer feedback providers and –receivers improve their writing to a similar extent, and that explanatory peer feedback comments are most influential with respect to students' perceptions of peer feedback adequacy. However, no direct relations were found between students' perceptions of the received peer feedback and their subsequent increase in writing performance. These results were believed to elucidate two findings that are informative for higher education researchers and –teaching staff. The finding that both providing and receiving peer feedback positively affect students' writing performance provides higher education teaching staff with a degree of flexibility in designing peer feedback tasks. For example, initially withholding received peer feedback could avoid issues such as students' distrust of their peers' feedback quality, while the exercise of providing peer feedback would still be likely to be beneficial to students' writing performance. Also, the finding that explanatory peer feedback most strongly related to students' perceptions of adequacy was argued to be important with respect to students' more general support for – and engagement in – the peer feedback process. This highlights the importance of emphasizing the role of explanations in peer feedback training and instruction.

Chapter six reported on the development of a questionnaire to assess students' peer feedback beliefs. This Beliefs about Peer Feedback Questionnaire (BPFQ) served a dual aim. For one, prior research into students' peer feedback

beliefs has adopted different approaches addressing a variety of themes. Therefore, the first central aim of the BPFQ was to contribute to the alignment and, consequently, comparability of research findings. Simultaneously, it aimed to provide a practical instrument for higher education teaching staff to monitor how their teaching practice influences students' peer feedback beliefs. Based on the variety of themes addressed in the literature, four scales were conceptualized: (1) students' valuation of peer feedback as an instructional method, (2) students' confidence in the quality of the peer feedback they provide to a peer, (3) students' confidence in the quality of the peer feedback they receive from a peer and (4) the extent to which students regard peer feedback as an important skill. These four scales, totaling ten items, were validated in a separate exploratory and confirmatory study, with scale reliabilities ranging between α = .67 and α =.82. Consequently, the BPFQ was considered a reliable, comprehensive instrument to assess students' peer feedback beliefs. The concise nature of the BPFQ was argued to make it an applicable instrument for both higher education teachers who want to conduct research within their own teaching practice as for researchers aiming to monitor the development of students' peer feedback beliefs over time.

In conclusion, the current thesis furthers our knowledge on a) the available evidence for the impact of formative peer feedback on writing performance, b) how students' ability match and feedback role as either peer feedback provider or –receiver relate to writing performance, and c) the relations between the nature of the peer feedback and students' perceptions thereof. Provided that future research confirms these findings, several implications follow. Formative peer feedback positively affects higher education students' academic writing performance, which it does to a similar extent as teacher feedback. This implies that higher education teaching staff can be confident that peer feedback contributes to students' writing performance. Students, however, could be skeptical to this notion as their peers may differ from their teaching staff in terms of domain-specific knowledge. Peer feedback may indeed have a different focus compared to teacher feedback. This thesis reported a trend where high-ability dyads focus more on content-related issues. This may imply that peer feedback

should as a complimentary feedback source to teacher feedback during the first years of higher education programs, and that it could be regarded as increasingly comparable to teacher feedback as students acquire more domain-specific knowledge and experience. The reported nature of first-year students' peer feedback also implies that they should be trained and guided in providing peer feedback that includes sufficient explanatory comments.

Some caution is in place as a result of the methodological choices that were made in this thesis. For example, the focus on writing performance assumed that increasing grades on a writing task reflect the increase of a student's writing skills. Also, what teachers perceived as controllable was aligned with planned behavior theory, referring to their perceptions of the extent to which they *could* adapt these variables. However, controllability did not directly incorporate the extent to which the teachers *would* adapt these design-aspects of peer feedback tasks. More elaborate research into the practicality of the different aspects of peer feedback task-design would therefore be valuable. A final methodological reflection concerns the absence of a no-feedback control group in the empirical studies of this thesis. A direct consequence is that this thesis can only draw conclusions with regard to the *relative* writing improvement for differently matched students or for students in different feedback roles.

In terms of practical implications and considerations, higher education teachers can optimize the impact of peer feedback by having students provide both formative comments and –scores to each other's written products. Also, higher education teachers can optimize students' perceptions of adequacy by emphasizing the role of explanations in peer feedback, as this positively influences students' beliefs about the importance of peer feedback as well as their confidence in themselves and their peers in the long run. Given the small effect sizes, matching students based on prior performance generally only appears to become viable when student-matching is relatively effortless as a result of automatization through ICT. Finally, providing and receiving peer feedback contributed similarly to students' writing performance. Knowing this, higher education teaching staff can provide students with opportunities to get used to the peer feedback process. For example, received peer comments

may be withheld during students' first experiences with peer feedback, thereby avoiding students' initial skepticism associated with, or triggered by critical peer feedback.

Whenever the preparation of students for a future career is considered as a broad central aim of a higher education curriculum, peer feedback should be regarded as an important learning goal in itself. Students' support for peer feedback is pivotal with respect to their engagement in the peer feedback process and the learning gains that can be expected thereof. Hence, it seems particularly worthwhile to explore how to cultivate a classroom culture where peer feedback is the norm and to investigate how students' peer feedback beliefs and skills develop over time. In this light, the current thesis supports higher education teaching staff in optimally designing peer feedback tasks. Additionally, the Beliefs about Peer Feedback Questionnaire can be instrumental in the systematic, long-term monitoring of students' peer feedback beliefs and the aspects of task-design that influence those beliefs. In the specific context of Leiden University, the findings and arguments presented in this thesis can help educational advisors and teaching staff in developing effective peer feedback tasks that are optimally supported by the students.