UNIVERSITY OF TWENTE.

OPTIMAL FEEDBACK FOR STUDENTS

BMS INNOVATION PROJECT 10

Faculty of Behavioural, Management and Social Sciences

Anna Bos-Nehles (HBE-IEBIS)
Alieke van Dijk (DDS-IST)
Veronica Junjan (HIB-PA)
Joyce Karreman (HIB-CS)
Ipek Seyran Topan (HBE-IEBIS)
Marloes Luttikhuis (CELT-TELT)

December, 2021

Acknowledgement: We are very grateful for the support that Tim Kraai offered in the administration and analysis of the survey and transcribing all interviews and for the facilitation by the BMS Teaching Academy. We also want to thank all teachers and students who have contributed to this project.

1. Introduction

This report is the result of one of the BMS Innovation Projects 2020: 'Optimal Feedback to Students'. BMS Innovation Projects are used to accelerate the continuous development of educational quality by educational innovation in combination with teacher professionalisation. Every calendar year, up to and including 2024, a budget is released from the 'Wet Studievoorschotmiddelen' (WSV). This law is the result of the abolition of the basic grant for students, which has been converted from a gift to a loan. Therefore, this budget should benefit education and our students. A part of the money is reserved for innovation projects from teachers and programme directors of BMS.

1.1 The purpose of this report

The project 'Optimal Feedback to Students' (Project 10) is granted to gain insight in optimal feedback mechanisms and students' needs for feedback. The goal of the project is to provide an overview of various feedback mechanisms and how to use them for various groups of students and teaching activities. The focus of the project is on teacher-student feedback in which we take the needs of teachers and students as well as the study context into consideration.

We start this report with a literature review of feedback and how it should be provided. Based on this literature review, we develop some feedback mechanisms that we want to focus on in this report. We continue by elaborating on the research design used to collect data and present the results of the various feedback mechanisms. For each mechanism, we always start with a review of the literature to present some evidence-informed knowledge of the feedback mechanism. We continue by presenting the results of the interviews with UT teachers and finish with the insights we gained from the students' need of feedback. Based on these results, in our reflections, we develop some best practices of optimal feedback and provide some tips and tricks on how to implement feedback in educational activities.

1.2 What is feedback?

Feedback is a well-known part of any educational context. According to Hounsell (2003, p. 67), "feedback plays a decisive role in learning and development, within and beyond formal educational settings. We learn faster, and much more effectively, when we have a clear sense of how well we are doing and what we might need in order to improve". More specifically, feedback contains information that allows comparison between an actual outcome and a desired outcome (Mory, 2004). This means it should provide information about the gap between actual performance and desired performance, enabling students to close this gap and, thus, improve their performance (Sadler, 1989). Feedback is an opportunity for learning and for encouraging an orientation towards learning goals (Knight & Yorke, 2003). Hence, Hattie (1999, p. 9) believes that "the most powerful single moderator that enhances achievement is feedback". To reach any learning objective, however, feedback must indicate how students can develop in respect to future work (Knight & Yorke, 2003), it should be appropriate and timely (Ramsden, 2003), suited to the needs of the situation (Knight & Yorke, 2003), and it should be appropriate to students' learning needs (Knight & Yorke, 2003). Thus, feedback depends on the needs of the situation (e.g., bachelor or master courses) and the needs of the students, leading to different feedback for students at different levels of their study.

Feedback can play an important role in both formative and summative processes. In this report we focus on formative assessment, that is effective, when it provides constructive and timely feedback comments and supports students to understand what good-quality work is in the subject are of their studies (Hounsell, McCune, Hounsell & Litjens, 2008).

1.3 Who provides feedback and how?

According to Hattie and Timperley (2007), the information that is provided in feedback should come from an agent, such as teachers, peers or from oneself. This means that feedback can come from a wide range of sources. When applied together this is also called multisource feedback (Nicol et al., 2014; Huisman et al., 2019), such as multiple peers who have multiple perspectives. Different peers can use the same assessment criteria to review the work of others. To do that feedback needs to use

consistent and transparent assessment practices with clear criteria that reflect on high-quality work (Poulos & Mahony, 2008). Students can co-create the assessment criteria and rubrics because research has shown that providing students with the opportunity to co-create parts of their own curriculum results in higher degrees of student satisfaction with the university experience (Elsharnouby, 2015). In a co-created curriculum students are treated as partners by shifting the way in which teachers and students relate to each other (Taylor & Bovill, 2018). Teachers can invite students to co-create their own assessment criteria because they follow Nicol and Macfarlane-Dick (2006) and believe that feedback needs to be viewed in a student-centred manner whereby students take control of their own feedback through a self-regulated approach (Butler & Winne, 1995). This means that students are engaged in a continuous process of assessing and reflecting on their work and, as such, students need to be more actively involved in the process of providing and receiving feedback. According to research results, feedback from various sources and perspectives, including peer feedback, can increase their self-regulated learning capacity (Nicole & Macfarlane-Dick, 2006; Topping, 2009).

1.4 Feedback mechanisms

Based on the provided understanding of feedback, in this report we will consider the following feedback mechanisms to student feedback and thus develop the following five sub-projects:

1. Peer feedback
2. Multisource feedback in a process of 360-degree peer feedback
3. Feedback for self-regulated learners in their bachelor and master thesis projects
4. Feedback for multidisciplinary groups of students
5. Development of assessment criteria for feedback through co-creation of assessment rubrics

The first sub-project is **peer feedback**. In peer feedback students provide and receive feedback from peers by assessing the quality of their fellow students' work and provide one another with feedback. We will investigate how teachers organise, prepare for and execute peer feedback in educational

settings. In addition, we aim to understand how students prefer to receive feedback and how they perceive the quality of feedback from peers in comparison with teachers.

In the second sub-project entitled **multisource feedback in a process of 360-degree peer feedback** we aim to understand which feedback sources are used and for what purposes and how feedback from multiple sources helps student learning. By integrating the feedback of various stakeholders, including *self-assessment*, *peer* feedback, *teacher* feedback and the feedback of *business partners,* we develop an overview of how to combine feedback from different sources in a coherent feedback process.

The third sub-project is called **feedback for self-regulated learners in their bachelor and master thesis projects** aims to develop an overview of the different forms of feedback provision to the self-regulated learners in different stadia of their educational careers (bachelor and master), with possible learning points towards acquiring the skills for life-long learning. The process of the feedback development for the self-regulated learners acknowledges the importance of the different sets of interests of the participants to the development and execution of the feedback process. The investigation brings into the picture the importance for the self-regulated learners to recognize, detect, and process the differences in feedback towards developing a product (thesis, research project) that complies with the rigor of judgment and standards of the scientific inquiry.

The fourth sub-project, **feedback for multidisciplinary groups of students**, will investigate what type of feedback students need and how this relates to their study programme to get more insight in how teachers can provide optimal, customized feedback to heterogeneous, multidisciplinary groups and how students in multidisciplinary groups can provide their peers with useful feedback, so the students can work together more effectively.

Sub-project five, **development of assessment criteria for feedback through co-creation of assessment rubrics,** investigates the role that students can play in *formulating rubrics* for both formative and summative assessment, the support that students might need to formulate a rubric that *balances the learning objectives and learning possibilities* as perceived by students, and the positive effects that this

might have on *students' engagement and achievement.* Furthermore, this project investigates how co-created rubrics might ease *providing (peer) feedback* during a course.

2. Methodology

For each of these mechanisms to student feedback, we start with a short overview of the relevant literature and follow with research results based on two research designs: interviews with teachers, and a questionnaire among students of the BMS faculty.

2.1 Interviews

We performed 13 semi-structured expert interviews with experienced teachers at the University of Twente about their best practices regarding feedback in education. We numbered the expert interviews as interviews with Teacher 1 up to Teacher 13. These teachers were selected because they were engaged or awarded teachers, followed extra education opportunities for teaching excellence or innovation (such as the SUTQ), were granted funding for education innovation by national initiatives (such as the Comenius grant), or did research about feedback or implemented innovative feedback tools in their courses. The research was approved by the Ethical Committee of the University of Twente.

The interview questions were based on the various feedback mechanisms and focused on the experiences of teachers and their best practices on how to implement feedback mechanisms in teaching. The interviews were either held in Dutch or English and lasted between 40 minutes and 1,5 hours. Interview recordings were transcribed and analyzed using a three-stage approach. In the first stage, the interviews were segmented into utterances; meaningful phrases with a single communicative function (Van Boxtel, van der Linden & Kanselaar, 2000). This means that each speaking turn of the interviewee might be divided in sub-sections depending on the information that was expressed during a speaking turn.

In the second stage, the content of the utterances was identified and grouped according to the different categories that were discussed during the interviews (i.e., peer feedback, multisource feedback in a process of 360-degree peer feedback, feedback for self-regulated learners in their bachelor and master thesis, feedback for multidisciplinary groups of students, and development of assessment criteria for feedback through co-creation of assessment rubrics; see Table 1). An additional category, Other, was added to code utterances that were either off-task or off-topic (e.g., clarification questions by the interviewee regarding the content of the interview).

In the third stage, a rubric was developed to classify the utterances. For each topic, a distinction was made between four different codes: 1) *experience* related to whether or not the interviewee has personal experience with providing feedback by means of different activities as distinguished in the different topics (e.g., whether or not the interviewee let students engage in peer feedback activities), 2) *application* referred to the way the different feedback activities have been applied and how feedback activities were organized by the interviewee (e.g., how the provision of peer feedback was organized), 3) *value* was used to indicate the interviewee's explanation how feedback activities were appreciated by the students (e.g., appreciation of (peer) feedback of different actors), and 4) best or bad *practices* that were described by the interviewee regarding different feedback activities (e.g., best or bad practices, resulting in advice or points to consider, regarding the use of peer feedback). See Table 1 for an overview of the different codes.

Table 1. Rubric for the classification of utterances from the interview transcripts

Classification of utterances/ Feedback mechanisms	**Experience (E):** Interviewee elaborates upon (personal) experience with letting students engage in peer feedback.	**Organization (O):** Interviewee explains how peer feedback was organized/ applied.	**Value (V):** Interviewee explains how peer feedback was appreciated by the students.	**Practices (P):** Interviewee shares best practices and bad practices, resulting in advice or points to consider, regarding the use of peer feedback.

Peer feedback (*Peer*)	I have used peer feedback in two of my courses.	Students handed-in their draft of the report, after which they were manually assigned to provide feedback to one of their classmates.	In the evaluation, students often indicated that they felt that peer feedback did not compare to teacher feedback.	My experience is that students should be assigned by the teacher, so that the objectivity of their feedback is not led by their appreciation of their peer.
Multisource feedback in a process of 360-degree peer feedback (*360*)	In my course, students also receive feedback from the client.	To receive feedback from the client, they had to schedule a meeting and hand-in their draft beforehand.	Students' felt that the feedback by the client helped them to get insight in what is needed for the theory to be applicable to the context.	It is helpful, as a teacher, to provide a feedback template so that it can easily be filled out by the feedback-giving party.
Feedback for self-regulated learners in their bachelor and master thesis (*Thesis*)	I am involved in supervising both bachelor and master thesis projects.	To provide feedback to my students, I ask the students to hand-in their draft 5 days before the meeting so that I can prepare my feedback before the meeting.	Students indicate that it is very helpful to receive feedback by placing comments in their written text.	I schedule meetings with students and have them hand-in their draft 5 days before the meeting. This provides intermediate deadlines for the students and helps me to gain insight in their progress.
Feedback for multidisciplinary groups of students (*Multi*)	In the module that I am teaching, students from different programs participate as part of their minor.	Students received feedback via a template. This was similar for all students.	Some students indicated that they needed more background information.	It is best to let students ask for more feedback if they need it; it is hard to predict what they already know and what they do not yet know.
Development of assessment criteria for feedback through co-creation of assessment rubric (Co-creation)	As a teacher, I am responsible for creating rubrics for different assessments in my courses.	Students were allowed to come up with suggestions for clarifying the criteria in the rubrics.	Students indicated that they learned a lot from thinking about the criteria before starting an assignment.	Students need guidance in formulating high-quality assessment criteria.

2.2 Questionnaire

We did a survey among all students of the Faculty Behavioural, Management and Social Sciences (BMS) of the University of Twente to better understand how we can improve the way we provide feedback to students. The purpose of this survey is to gain insights into giving and receiving feedback from a student perspective. We hope to discover what methods for giving or receiving feedback is preferred by students and how this can help to improve their learning experience. We collected data from about 289 students from various study programmes at the bachelor and master level (e.g., International Business Administration, Communication Science, Educational Science and Technology, Public Administration, Psychology and Industrial Engineering and Management). The survey was distributed to students through the website of each BMS study programme and related student associations. Student participation was fully anonymous, and their data did not store along with any personal information. The survey took approximately 15 minutes per student. There were 14 main questions in the survey about general understanding of feedback, peer feedback, multisource feedback in a process of 360-degree peer feedback, feedback for self-regulated learners in their bachelor and master thesis, feedback for multidisciplinary groups of students, and development of assessment criteria for feedback through co-creation of assessment rubrics. Every question had its own sub questions. Survey questions and results are integrated in the following chapters.

3. Peer feedback

Feedback is an inherent part of student learning. Especially the value of feedback by peers is known to be an effective educational tool that is often used in Higher Education. Students learn from providing and receiving peer feedback and assessment, a concept in which students are positioned as active players in providing and receiving feedback. Peer feedback and assessment is an educational arrangement in which students assess the quality of their fellow students' work and provide one another with feedback (Dochy et al., 1999). Although peers are no domain experts and are usually not

regarded as a “knowledge authority” (Gielen et al., 2010: 305), we know from recent research that formative peer assessment and feedback result in higher levels of student performance (Li et al., 2020), academic writing performance (Huisman et al., 2019), student learning (Gielen et al., 2010; Li et al., 2020; Stobart, 2008). Peer feedback is also acknowledged because it can increase the frequency, extent and speed of feedback for students. After all, the number of feedback assessors and feedback opportunities are increased (Gibbs & Simpson, 2004). Engaging in peer feedback may also help students develop social skills (e.g., learning how to provide and accept critical comments), justify their position and decline non-productive suggestions (Topping, 2009).

Peer feedback can be used in different forms. It can be summative or formative. In this report we mainly focus on formative peer feedback, in which students provide each other with feedback on the content or process of their work, but do not assess the work of their peers. In content peer feedback, students provide feedback about the "what” of the work of their peers, usually on the writing or a presentation (poster). Process peer feedback focuses on the "how” in working together and often incorporates criteria such as collaboration and communication. Both forms of peer feedback are used to improve the performance of peers, and in both forms, students need to provide feedback and receive feedback themselves. Peer feedback can be provided anonymously or not. If the peer feedback is not anonymous, teachers can decide to make peer feedback duo’s or ask groups of students to provide feedback to each other. Also, within a group of students, students can provide feedback on the content or the process of their peers’ performance. Based on the interviews with experts from the University of Twente and the survey with BMS students, we will provide insights in the mechanisms that teachers currently use to engage students in peer feedback and what students need and want regarding peer feedback. In our reflections, we will provide some best practices and tips for teachers and study programmes on how to engage in peer feedback.

3.1 Teacher opinions and experiences

In our interviews, we have asked several questions about peer feedback. The teachers were, overall, positive about peer feedback; they consider it to be a valuable educational tool. Most of them have experience with peer feedback in their courses and modules. They often seem to use this tool as part of a larger assignment, for example when students have to write an extensive report that they can submit several times during the process to get feedback from either their peers or their teacher. This process needs to be streamlined by the teacher.

"The process takes the whole quartile. In the third week, they get feedback from me about, for example, their introduction, to show them what to do, and then, they ask their peers for additional feedback. […] And in week nine or ten, they submit their final version. It is optional, then, to ask each other again to provide feedback." (Teacher 8)

"The courses are organized so that you first have to introduce the process, then have the authors create the deliverables, have another week to assign the reviews, have the next week for the reviewers to produce the feedback, and then share the feedback with the authors. So, it takes a lot of time." (Teacher 1)

Although the teachers we interviewed considered peer feedback to be a relevant part of the learning process, not all of them had articulated ideas about how to prepare and train students to provide and receive useful feedback and about which feedback mechanisms to use in different contexts. Furthermore, the teachers had different opinions about the relative importance of providing and receiving feedback.

3.1.1 Feedback preparation

We have asked the teachers how they prepared their students to provide their peers with feedback and to receive feedback from their peers. Their answers differed; some did not train their students at all, but a few others had very clear opinions about how to train students to provide others with

comments on their work. Although most teachers indicated that they did not use any specific training methods and that they did not provide their students with extensive explanations about giving and receiving feedback, they all gave their students some instructions about what they expected from them.

"I do this in a very simple way: What went well, and what would you recommend? What could be improved? And I tell them that their feedback should be constructive." (Teacher 2)

Some teachers told us that they did now know what would be the best way to train students, but that they recognized that students have difficulties to provide useful feedback and that they do need some training.

"I have noticed that students find it difficult to give feedback like we do." (Teacher 3)

"I teach in module 1, first year. So, it is their very first module. And they are very actively trying to give feedback – they read and underline things – but the feedback they give … It is useful, but certainly less extensive than our feedback." (Teacher 3)

This particular teacher, together with the second teacher of the course, has developed a brief training session about providing and receiving feedback that takes half a lecture and that includes some basics about constructive feedback that is completely based upon their own experiences. Only a small number of teachers seemed to have developed a consistent view on the value of peer feedback and on how to enable students to learn how to give feedback on their peers' work. One of them stressed that students should first realize that giving feedback is not just about someone else's work but that the provider and the receiver of feedback share the same goal: to improve a report or other deliverable.

"Feedback is not finding the errors of others. Feedback means that the reviewer and the author are on the same team and they collaboratively try to improve the deliverables that happen to be authored by one of them." (Teacher 1)

This teacher considered it to be important that students are trained to become good reviewers. One of the important parts of the training is that, in this teacher's opinion, students should know exactly what is expected of them. They should see examples; they should receive guidelines that tell them where to focus on.

"When you want to do feedback, you need to train the reviewer. So of course, there is not time to train actually the reviewer, but you can give examples, you can give a template. I always give a template for review. Not necessarily a rubric, but make it explicit, like what are the strengths? Is the argumentation fine? You know, the things that are interesting. They should know the review guidelines for sure." (Teacher 1)

Apart from indicating the importance of training students, this particular teacher, but also some others, explained that gaining experience in providing feedback is important as well. So, students should practice giving and receiving feedback regularly.

"We know that if we repeat the process throughout the semester several times and we have done that as well, and they get better of course. But it is also a matter of practice, it is also a matter of experience." (Teacher 1)

In conclusion, students do not seem to be able to provide their peers with useful feedback without practice or training, but not all teachers are aware of this or they do not know how to optimally train their students. Teachers who do train their students to be able to provide their peers with useful feedback, whether they do this by presenting the students with a brief training session based upon their own experiences or by using a well-thought-out training programme, notice that the quality of their students' feedback improves.

3.1.2 Providing and receiving feedback

We asked the teachers what they believed students learned most from, providing feedback or receiving feedback. The answers are diverse with many experts sharing the idea that students learn from both, providing and receiving feedback. Those teachers who were very experienced with peer feedback and who have used it regularly in different courses and contexts were quite convincing. In their opinion, students learn most from providing feedback to peers. There seem to be different reasons for this. As an outsider it is often easier to recognize mistakes or unclarities than as an author of the text. Students contrast and compare their own text with this of their peers and learn from their peers' ideas but also mistakes. They might get ideas on what to add or how to explain certain things based on the example of their peers' work. One expert explained that providing feedback is more valuable than receiving feedback because providing feedback has psychological advantages over receiving feedback since students will accept their own suggestions easier than the suggestions by others:

"*Definitely by doing the reviews themselves […] But there are also psychological reasons why the insights that you get by reading others' work, you accept them immediately. Because if you get an idea by reviewing others, it's your idea and you already own this insight. So you are going to implement it. Many reviewer comments are not accepted, even though they are good comments just because they come from someone else […] But create a review is a hard process. You are actually an author and an analyst. You have to compare. You have to synthesize. You have your own level of knowledge as the threshold. Everything that's below that needs to be fixed. Everything that's above that you may not understand.*" (Teacher 1)

3.1.3 Feedback organisation

There are different ways in which teachers organise peer feedback in education. Teacher 1 is the most experienced teacher using peer feedback and he/she has shared the most common ways. Peer feedback can be used individually or in groups. Using peer feedback on individual student work, in

which students provide and receive feedback to and from peers, can be done anonymously or not. When it is done anonymously, students do not know the work of which student they review and who has reviewed their work. One example on how to organise this is through a three-selection protocol:

"The most common one was individual, and it was the three-selection protocol that I also wrote papers about, and I like it because it seems to work, it means that the students work primarily individually to create the deliverable and then all the deliverables or a good selection of the deliverables is open to the reviewers. And the students are free to select which ones to read and review." (Teacher 1)

If peer feedback is not organised in an anonymous way, one can develop organised pairs:

"I tried one on one, which means that one student gives feedback to another student, and they are a pair. So, this is called the assigned pair." (Teacher 1)

For group assignments, peer feedback can be used to in different ways. Examples are jigsaws, hybrid approaches and feedback based on different roles:

"I have done a jigsaw, which means that we have a group assignment, but every member of the group has to review a different deliverable, which means that they all get different perspectives by reading different deliverables. And then when they come back to the group, they have different things to say." (Teacher 1)

"Sometimes I do a hybrid approach, meaning that I assign one and then I ask the students to freely select the remaining number of reviews." (Teacher 1)

"They developed an idea based on the theory and then they come up with a prototype, like a working prototype. And what's the most important part for me is to be for the students to be able to assess each other's prototype let's say objectively. Try to experience it like a user, and then provide feedback to the designer group. So that was the goal of the feedback, like, OK, you are now the designer. Like, it's a very, very short course, by the way, seven weeks. For six weeks or five and half

the students design and experience as a designer. And then they swap the role, try to become a user and then assess the other prototypes as a user, try to understand what the designer group wanted to achieve and whether or not the group achieves it." (Teacher 4)

Peer feedback can be graded or not. Most often our teachers do not assess the quality of the peer feedback, but there are examples of how this can be used:

"And what I did is, actually I announced in the beginning of the class, I said, OK, the quality of feedback is really important they are third year students. So they should be able to have a certain professionalism. So that's why I'm not going to grade the prototypes, but I will grade the feedback that students gave to the other group. And I also provided a guidance for that. OK, the feedback should do this and that should not do this and that. And I will grade the feedback." (Teacher 4)

3.2 Student opinions and experiences

Students understand the benefits of feedback and are also positive about the opportunity to provide feedback to peers and receive feedback from peers. They prefer to get face-to-face feedback or written feedback that can also be provided in a digital form, as highlighted by Figure 1.

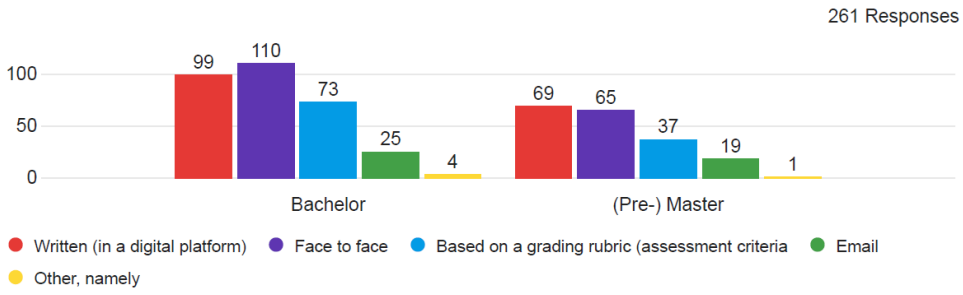

Figure 1. *Student's preference about source of feedback*

Students believe that involving students in the feedback process can be meaningful and that it can help them in their learning process. They understand that it is important to be able to give constructive feedback and to deal with critical feedback. As indicated by Figure 2, the majority of the bachelor and

master students agree that students can be a valuable source of feedback. They believe that students should be asked to be involved in the feedback process because they believe that they can learn valuable skills through providing feedback to their peers. Figure 3 displays that students tend to agree that being able to provide constructive feedback is a valuable skill to be learned. In fact, being able to provide constructive feedback is considered as a 21st century skill.

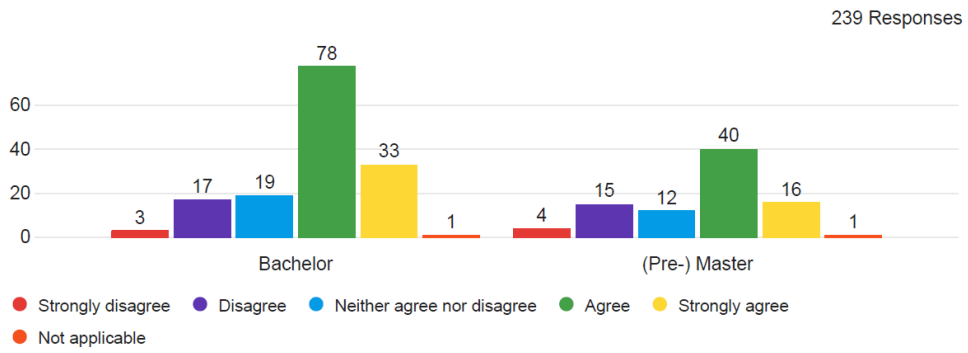

Figure 2. *Student's opinion about involving students in feedback through using peer-feedback*

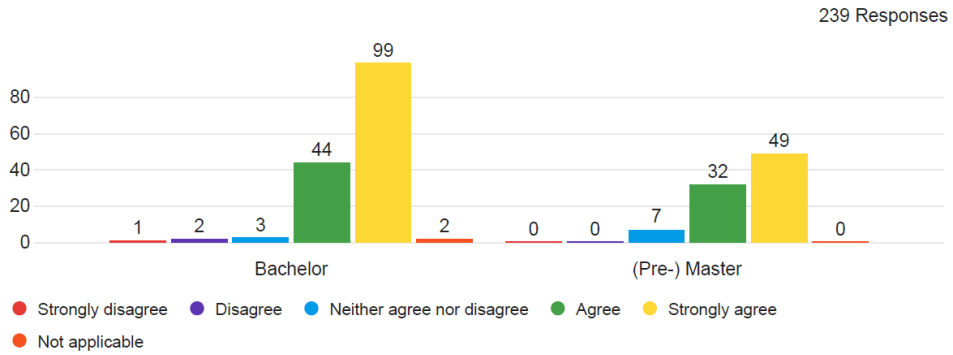

Figure 3. *Student's opinion about giving constructive peer feedback as an important skill*

Asking students about the reasons for the purposes of using peer feedback, the majority of the bachelor and master students understand peer feedback as a reflection tool and believe that it is used because it will help them to improve their work. Figure 4 shows students' opinions about the teacher's purpose for using peer feedback.

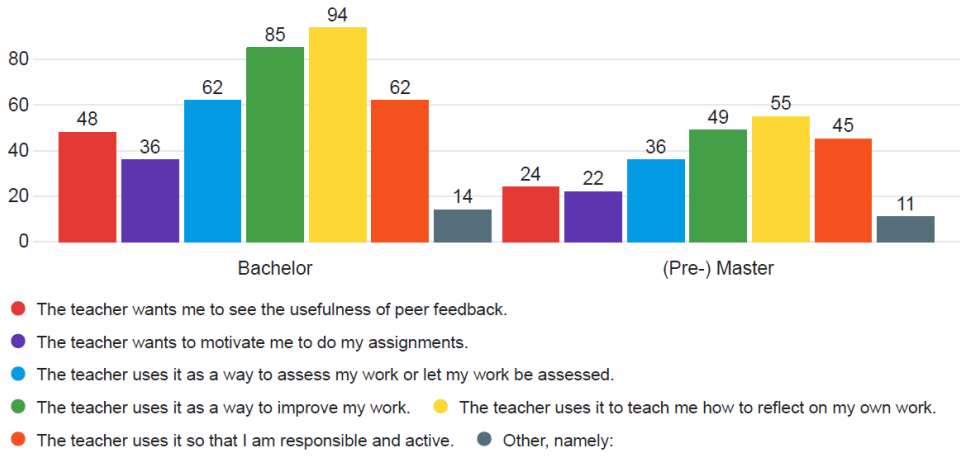

Figure 4. *Student's opinions about the purpose(s) for teachers to use peer feedback*

We understand from the survey that BMS students are not very used to peer feedback yet. Maybe because of this reason students believe that providing feedback is more difficult than receiving feedback (Figure 5), but that they learn most from receiving feedback (Figure 6). Teaching students how to provide effective peer feedback and how to deal with received feedback from peers may be a valuable addition to the current teacher-focused feedback.

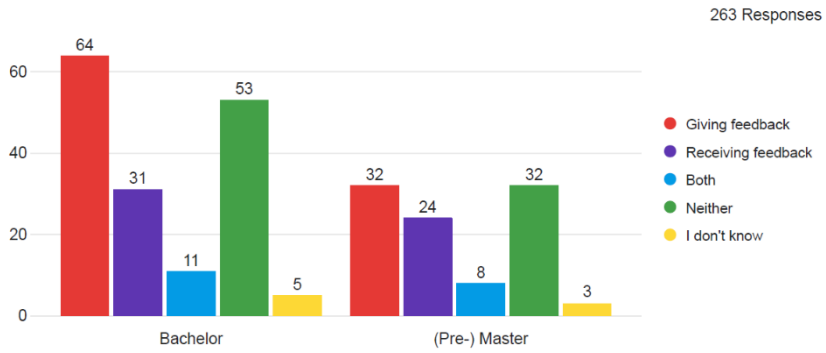

Figure 5. *Students' feelings about the difficulty of giving and receiving feedback*

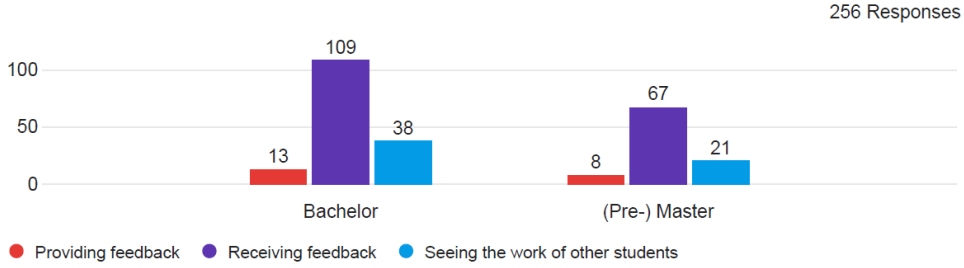

Figure 6. *Students' opinions about learning from receiving feedback, providing feedback or seeing the work of other students*

However, many students believe that teachers mainly use peer feedback because it is "faster and cheaper" than teacher feedback and that it saves time of the teacher. From the open questions in the questionnaire, we understood that some students also believe that teachers make use of peer-feedback because they are lazy and prefer students to do the work. They believe that teachers should provide feedback and if peer feedback is used and thus prefer to receive feedback from teachers (Figure 7).

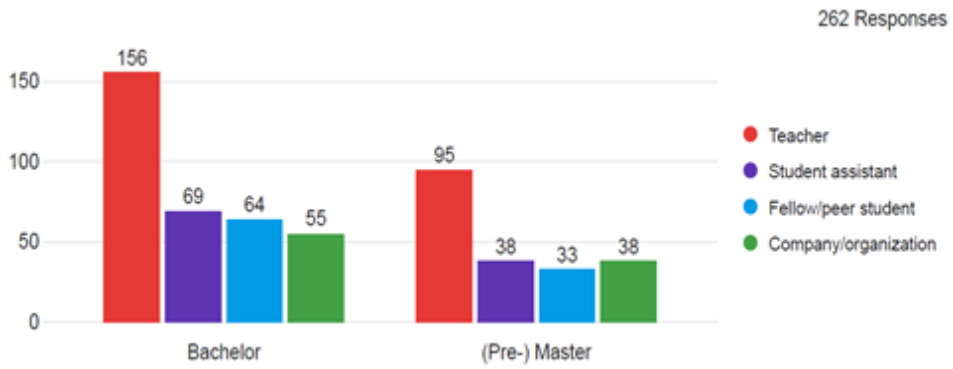

Figure 7. *Feedback sources*

A Figure 8 shows, they do not believe that feedback from students can be as valuable as that of teachers.

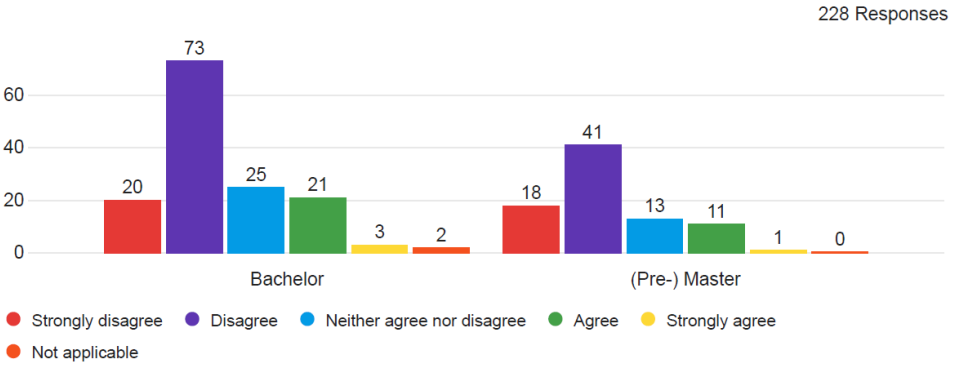

Figure 8. *Students' opinions about the value of peer feedback (Feedback from fellow students is just as valuable as feedback from the teacher)*

Students do not seem to trust their peers to provide the same quality of feedback as the teacher would provide because they feel that students do not take it seriously enough and are never as critical as the teacher. One student shared the following with us:

"Sometimes peers are not motivated to give appropriate feedback. If the teacher keeps an eye on the quality of the peer's feedback it would be much more helpful." (Student)

Based on their lack of trust in peer feedback, students believe that peer feedback can be used to support teacher feedback, but not instead of teacher feedback. We conclude from the survey that students are positive about feedback and believe it is important and valuable, but they do not have a lot of experience with peer feedback and thus do not trust their peers to provide valuable feedback. They still trust the feedback from teachers most and believe that it is the teacher who should provide feedback to them.

3.3 Reflection on peer feedback

BMS students and teachers seem to be quite traditional about the mechanisms that are used to provide feedback to students. Not many of the BMS teachers make use of peer feedback yet and they prefer to rely on their own expertise and experience to provide feedback to students. On the other hand, also students prefer to receive feedback from teachers. The reason for this may be also that students are not used to any other source of feedback or do not trust others to provide constructive feedback, because they have not learned how to do it. The results presented above about providing and receiving feedback show that since students are used to receiving feedback from teachers, students also think that they learn most from receiving feedback and find providing feedback more difficult. If BMS wants to make use of peer feedback to offer students room to develop valuable business skills (providing and receiving feedback) and to be able to develop more self-regulated learning behaviours, there are three suggestions on how to make use of peer feedback.

1. Train teachers and students on how to provide constructive feedback to peers. Teachers would need to understand the benefits of peer feedback for themselves and for the learning process of their students. In addition, they would need to get coached on how to integrate peer feedback in a course or thesis project and how to deal with this feedback. CELT could play a valuable role in this but also the BMS Teaching Academy could facilitate learning from colleagues and sharing of experiences between teachers from various study programmes. Students would also need to learn of the benefits of peer feedback for themselves and for their peers. Since providing feedback to peers requires them also to self-reflect or self-evaluate their own work and since providing constructive feedback is a valuable business skill for them to learn, providing feedback to peers helps students to learn. Providing feedback to peers obviously also has advantages for the peers. Students can help each other. However, providing valuable, constructive feedback to peers might also result in reciprocation by peers to also provide feedback on their own work.
2. Develop peer feedback skills in the curriculum by starting early in the bachelor. As indicated above, students need to learn to provide and receive feedback from their peers. However, training students in each course or module on how to do this is not efficient. Instead, we suggest that students start with their peer feedback training programme in the bachelor. Since the bachelor is based on project work in the Twente Educational Model (TEM), it would make sense to focus on group peer feedback in the bachelor. There are two options to do this: either students can be asked to provide feedback to their peers in their own project group, or one project group provides feedback to another project group. In the first option, students evaluate the performance of their peers in the project work. A valuable tool for this form of feedback is the Canvas-integrated tool Buddycheck. To ask students to provide feedback on other groups, teachers do not need to use a tool. Asking peer groups to provide feedback on a presentation of a peer group is the easiest way. However, Eduflow also offers the opportunity for groups to provide peer feedback to other groups from 2021/22. The bachelor programme

also offers opportunities for students to develop process peer feedback skills. Since students need to learn in the bachelor on how to collaborate with other students in a team, even if the team consists of students of different nationalities, cultures or study programmes or specializations, students can benefit from providing and receiving process feedback from their peers. The collaboration or communication in the team are common criteria for process feedback, but teachers could also add other criteria such as student creativity, problem-solving skills or writing proficiency. Once students have learned to provide feedback in or between groups or based on process criteria, they can learn to provide feedback on the content of the writing of their individual peers at the end of the bachelor (e.g., bachelor thesis) or the master.

3. To integrate peer feedback in more courses or modules in the bachelor and master and to convince BMS teachers of the value and benefits of peer feedback, the BMS faculty can play a role to share peer feedback successes. This could be done on the basis of the teacher perspective or the student perspective, preferably based on both. Teachers can share their peer feedback successes with their colleagues through presentations or workshop organised for example by the BMS Teaching Academy or by programme meetings in the bachelor and master curriculum. Alternatively, the BMS faculty could provide a teacher forum in which teachers can share their best practices and can advise their peers on how to implement peer feedback in courses. The BMS Teaching Academy currently provides a Microsoft Teams page in which announcements are shared. This could be used also to proactively share best practices and successes. However, to convince teachers and programme directors of the value of peer feedback, student successes should also be shared. This could be student experiences with peer feedback processes in videos, presentations or teacher-student communications, an improvement in student results due to peer feedback processes or student evaluations of peer feedback processes.

4. Multisource feedback in a process of 360-degree peer feedback

We know of the benefits of peer feedback for student learning and performance (Gielen et al., 2010; Huisman et al., 2019; Li et al., 2020). However, feedback from multiple peers and multiple perspectives, also called multisource assessment, seems to have even higher effects on students' writing performance (Huisman et al., 2019; Nicol et al., 2014), student learning (McGourty et al., 2000) and is better equipped to engage students to take an active, reflective role in learning (Mulder et al., 2014). Also, HRM evidence shows that 360-degree feedback is highly effective for individuals' performance development and evaluation (Atwater et al., 2007; Campion, Campion & Campion, 2015; Hensel et al., 2010). Feedback from various sources and perspectives, including peer feedback, teacher feedback and self-assessment, can also help students to take control of their own learning, i.e., become self-regulated learners (Butler & Winne, 1995; Nicol & Macfarlane-Dick, 2006; Topping, 2009).

According to Tee and Ahmed (2014: 579), existing pedagogical approaches in feedback are often "fragmented and ad hoc in nature". This is why they suggest an integrated, holistic 360-degree feedback system that showcases the interplay between self-, peer and teacher assessment to enhance student learning (McGourty et al., 2000; Tee & Ahmed, 2014). Other advantages of 360-degree peer feedback are e.g., student engagement as active learners (Mulder et al., 2014; Tee & Ahmed, 2014), and higher effects on students' writing performance (Huisman et al., 2019; Nicol et al., 2014). Building on this holistic 360-degree feedback system, we add an important, though currently neglected, stakeholder to the 360-degree feedback process: business partners. Business partners are a valuable feedback source because they provide real-time and practical feedback to students that helps them to develop practical and societal implications of their work. Involving business partners in the provision of feedback to students has several advantages as indicated by the university-business cooperation (UBC) literature (Galán-Muros & Davey, 2017; Tessema & Abejehu, 2017), in which students and business partners co-create parts of the curriculum (Plewa, Galán-Muros & Davey, 2015; Tessema & Abejehu, 2017). Adding business cooperation in curriculum delivery to the advantages of multisource

feedback provides students with the opportunity to gain immediate feedback on the adequacy and practical relevance of their developed solution and develop intrinsic real-life experiences. In the next part we will elaborate on the ways our colleagues use multisource feedback in their courses and how they involve company representatives of business partners in their curricula.

4.1 Teacher opinions and experiences

Many of the experts we interviewed had experience with peer and teacher feedback and used this in their courses, as explained above. Since feedback is a time-consuming process for a single teacher and because teachers believe that students can benefit from feedback from various sources and perspectives, some teachers combine different sources of feedback. The most common combination is that of integrating teacher feedback with peer feedback. Self-evaluation of self-assessment is a feedback form that is not often integrated in the feedback process. Teachers expect students to self-assess their own work but would not usually ask students to self-assess their work based on specific assessment criteria. They would rather provide examples or best practices that students could use to compare their own work with and thus indirectly self-assess their own work. Involving other stakeholders in the feedback process was not very common. Involving business partners or external stakeholders in the course happens more often, e.g., through guest lectures, but these stakeholders are rarely asked to provide feedback to students and students are not often encouraged to seek feedback from them. External bachelor or master theses supervisors are often the exception. They often play a role in the learning process of students.

4.1.1 Combining teacher and peer feedback

Peer feedback does rarely replace teacher feedback. Teachers know that their feedback can be valuable to students, and they know that students would always also expect feedback from the teacher. However, providing feedback to many students is time consuming and thus some teachers appreciate the combination with feedback from peers.

"It's time consuming, of course, when one teacher or two teachers provide detailed feedback. Well, in the other hand, students expect that." (Teacher 4)

Asking each student or group of students to provide feedback to one other student or group of students costs the students less time than the teacher providing feedback to all students or groups of students. Especially in larger courses providing detailed feedback can be a very time-consuming activity. Combining this feedback with feedback from peers is thus considered as a valuable addition. There are different ways to combine teacher and peer feedback. Feedback from both peers could be provided independently from each other. In this case teachers review the work of students and provide feedback to students and peers do the same thing. The same assessment criteria can be used for both sources of feedback, but teachers can also decide to use different assessment criteria for the peers (e.g., argumentation, writing style and logical flow) and for teachers (e.g., research problem and question, methodology and research design, implications). Both feedback sources can provide written or oral feedback. Teachers would often provide written feedback to students or combine written feedback with oral feedback. The same is possible for peers. However, many teachers ask peers only to provide oral peer feedback based on a student presentation, as the below example illustrates:

"And what I wanted to make sure of is that they get the feedback which is required not only from us, but also from the students. So oftentimes they have to upload their work via canvas. Then I can provide them with feedback and then also they have to present their outcomes and then also get feedback from their peers. There's a three step process, basically." (Teacher 6)

An alternative way to combine teacher and peer feedback is that teachers provide feedback on the peer feedback or add to the feedback of peers. This can be done by assessing the peer feedback, as the following example illustrates:

"I think this way of first asking groups to provide feedback to each other and then assessing their feedback, works well for at least some of the assignments I must say, yeah." (Teacher 4)

4.1.2 Teacher vs. peer feedback

As already indicated in the peer feedback results, students tend to accept the feedback from the teacher over the feedback from peers. They consider the teacher as the expert and expect the teacher to provide comments that are to the point and strategic. However, students tend to prefer teacher feedback over peer feedback because they know that the teacher will eventually grade their assignment. Thus, they rather follow the feedback of the teacher, because they feel that this feedback will lead to a better grade. It is a strategic decision to prefer teacher feedback over peer feedback and not necessarily a decision based on the quality of the feedback. Teacher 1 explained that the identity of the teacher as a feedback source is the reason why they rather accept teacher feedback than peer feedback. If students would not know who provided the feedback, they may not notice a difference in quality.

> *"[…] The most important thing though, is that the identity of the expert is known, which means that the students know that this feedback comes from the person that's going to actually grade their performance. So it is kind of a gospel thing. So acceptance is absolute because of that. If however you try, we did that accidentally somehow. If you tried to provide your expert feedback along with peer feedback, you may see differences there. Because the students may accept or reject your expert feedback if it is disguised as peer feedback [...] So it can be also a matter not of the quality of the feedback, but of the context, like who's giving the feedback. Who is the owner of the feedback? So it has a different acceptance from the students."* (Teacher 1)

4.1.3 Involvement of business partners

Those teachers who involve business partners in their courses, usually appreciate their point of view because they are considered as subject matter experts, or they are the clients or customers of a specific project. Some teachers also develop learning objectives for which feedback from clients or business

partners is crucial. It could be that students need to develop a product or service that meets the client's needs, or they need to be able to provide practical implications and recommendations.

"So the external partner was pretty much a partner of mine giving feedback. And they were the SME, the subject matter experts. So if they're [business partners] available, yes, this is the most valuable feedback because they are the client. Even if you disagree even if you think that, well, they could have done it better. It's their product, they work for their product." (Teacher 1)

"They [business partners] have different questions, mostly focused on the practice, on what they can get out of it as a company. And I think that's also a good. So our focus might be slightly biased. The external supervisors of companies could give more insights into practical application." (Teacher 6)

The opinion of business partners is considered as important because it focuses on the practice and provides insights into practical applications. Business partners have a different perspective and different interests than students and teachers. The diversity of perspectives is appreciated and is used to develop a dialogue or to let students combine the different viewpoints and synthesize.

"The stakeholder from the company has different interests and the students have. So I always try to let's say stimulate a dialogue, but I'm not really in control of the dialogue. I see differences. If you have students, it's more isolated and as soon as there's somebody from outside, then you're also dealing with interest." (Teacher 5)

"So what I do see is not only peer feedback, but at one point they start talking to customers. So they will get feedback from the customers as well, and then they have to decide whether or not they want to incorporate that." (Teacher 6)

If teachers involve business partners in the feedback process, then teachers usually do not interfere in this process. That means that they do not necessarily instruct students on how to seek feedback from business partners or business partners on how to provide feedback. An expert explained it as follows:

"The subject matter expert give them feedback, I'm not interfering with that feedback. I'm not telling them how to give feedback or where to give. […] So the students will come up with questions for the SME. To get the correct feedback. But if they do not ask the right questions, they will not get the correct feedback, but I'm not present for that process." (Teacher 1)

"I cannot tell them how to give feedback. And it's very hard to persuade them to train them, how to give different feedback. So they are professionals, they are successful in what they're doing. They know what will be important for their company or the product." (Teacher 1)

That means they also do not develop specific criteria on which the business partners should provide feedback. Since they consider them as subject matter experts, they provide them with freedom in how to provide feedback and on what aspects.

"We don't provide them [business partners] any rubric or guidance for the feedback. It's just what they think." (Teacher 4)

In some cases, business partners are involved in the formative feedback process by providing general feedback that is not based on specific criteria. Business partners are not often involved in providing summative assessment. Although they are considered as experts on the subject matter, they are not considered as experts in educational experts, as expressed by one of our teachers:

"*No, they're [business partners] not involved in grading. Not in that sense. And I wouldn't involve them because they are not experts in educational matters."* (Teacher 1)

This is the reason why teachers usually do not involve business partners in the grading of assignments or project reports. One teacher shared however, that he may take the assessment of the business partner into consideration through upgrading or downgrading the grade of the teacher by one or two tenths of a point.

"And if the grade is at a certain threshold towards a, let's say, seven point four, seven point five or whatever, then I'm going to look into what sort of things they [business partners] come up with

and see if that could lift the grade towards a higher grade. Yes or no? Most likely I will not use it for negative grading purposes. It's just that if I feel that it could be something, for example, in that domain of independence and that sort of thing, then that might just flip the coin towards the positive edge." (Teacher 6)

Teachers may also involve other stakeholders in the feedback process, such as external academic staff or tutors. However, these stakeholders usually provide feedback that is comparable to the teacher feedback or is considered as feedback from a teaching source. However, since 360-degree peer feedback is about combining different sources, from different stakeholders, in the feedback process, these academic stakeholders also play an important role in the learning process of students.

4.2 Student opinions and experiences

BMS students are quite traditional in their feedback demands. They prefer to receive feedback from teachers. As discussed in the peer feedback part already and presented in Figure 9, students appreciate the feedback from the teacher most. Feedback from other stakeholders, such as peers, student assistants of business partners, are less demanded than the feedback they receive from the teacher. Bachelor students even seem to value the feedback from business partners the least.

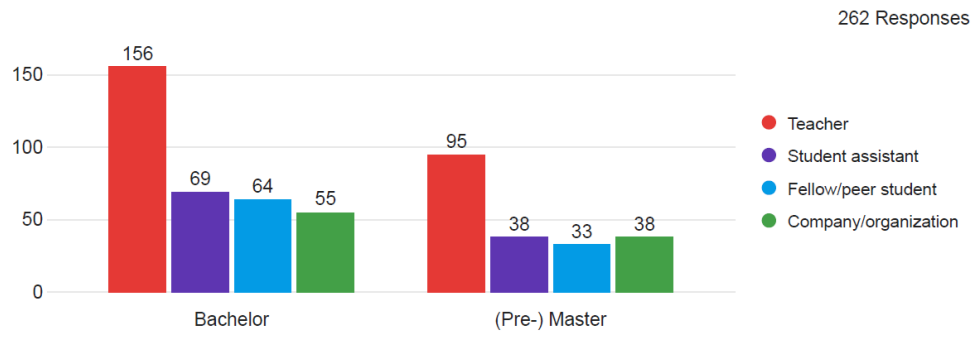

Figure 9. *Students' preferences about receiving feedback from different channels*

When we asked students to compare various sources of feedback for their thesis project, we see that also Figure 10 shows that students prefer feedback from teachers and/or friends or fellow students.

For the bachelor and the master level, business partner feedback is on place three of the support sources for the thesis. As indicated earlier, business parts at BMS are usually involved in the feedback process during the bachelor and master thesis, but less so for feedback in courses. Our quantitative results based on the students' perspectives seem to confirm this.

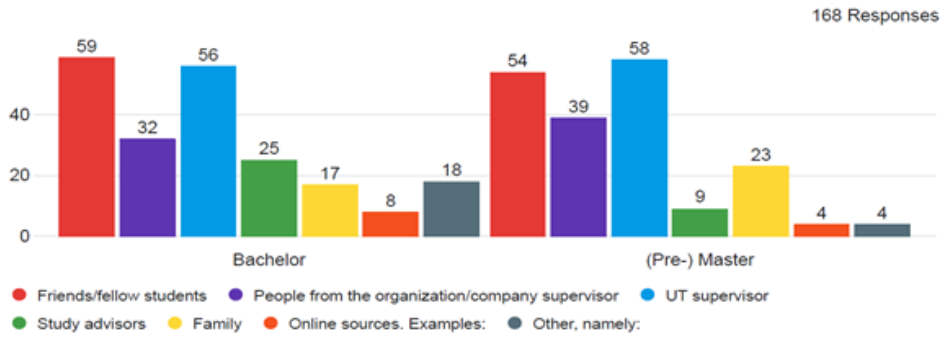

Figure 10. *Preferred feedback sources*

4.3 Reflection on 360-degree peer feedback

The results of the survey and interviews show us that BMS teachers do not yet use other sources of feedback except for teacher feedback and sometimes peer feedback. Business partners are often invited in courses/modules, students work on real-life challenges or problems and many students write their bachelor and master students with a company. However, in these education forms, students do not yet seek feedback from business partners. The only exception seems to be during the bachelor and master assignment. Although we see some nice best practices on how to use peer feedback from UT teachers, BMS teachers do not seem to make much use of peer feedback yet. We see three opportunities to integrate more stakeholders in the feedback process.

1. Make use of the many contacts BMS teachers have with business partners and how they are integrated in existing courses. Next to providing guest lectures and real-life problems, business partners could also be asked to provide formative feedback to students. It does not seem realistic to ask business partners to provide written feedback, but they could be asked to

provide feedback on a presentation or poster. However, that is not enough. Teachers would also need to integrate this feedback source with other feedback sources and ask students to reflect on the feedback received from business partners and to make use of it to improve their work. Business partners can also be asked to provide summative feedback to the work of students. In some study programmes, company supervisors are invited to participate in the assessment committee of master and bachelor students. However, we saw huge variation between study programmes about this practice. Our experts advised us to be careful to engage business partners in summative feedback, because they are no appointed examiners. This is why in many programmes, company supervisors are asked to provide formative feedback about the performance of the student in the company, and that teachers can take this feedback into consideration for their summative evaluation of the student's work.

2. To make more use of self-assessment or self-evaluation, teachers would need to have clear assessment criteria that are shared with students. Some BMS teachers make use of good examples and ask students to compare their own work with that of the example, but they could also (co)develop clear and concise assessment criteria and share them with students early in the course. However, self-assessment would need to be integrated into the other feedback mechanisms and sources. Thus, teachers would need to schedule the use of self-assessment and plan when it would make sense to ask students to self-assess their own work and how it should be used.
3. Involvement of other stakeholders in the feedback process. Next to self-evaluation, peer feedback, teacher feedback and feedback of business partners, teachers can also decide to involve other stakeholders in the feedback process. Examples of those stakeholders may be teaching or student assistants, external PhD students, graduate students, older students or students of different study programmes, previous university colleagues who pursued a career outside academia but have the academic experience, university colleagues who also have a

career outside academia, or colleagues of different study programmes, expertise areas or specializations.

5. Feedback for self-regulated learners in their bachelor and master thesis

Writing a bachelor or a master thesis represents a crucial test for students towards completing the requirements to obtain a bachelor or a master degree. The requirements to which a graduation thesis needs to comply with are built in the programme objectives and meet the terms of the domain specific competencies as agreed by the appropriate accreditation authority (Chu and Westerheijden, 2018). Also, the thesis is (usually) an individual endeavor of the student who works (under supervision) through the different phases of a research project with the goal of writing the thesis. The thesis is an integral part of the degree pursued by the student. The presentation and defense of the thesis – the colloquium- is usually the last step that the student needs to complete before receiving their diploma. Throughout this research endeavor, the student is supervised by a committee which usually consists of two teachers. When the thesis is conducted in an external organization, the student is also supervised by a responsible person employed in the organization.

The graduation thesis takes an integral part in the subsequent orientation of the student in their educational career (in the case of bachelor theses) or plays an important part in the job applications (for the master students). Because of these functions, the thesis usually has a special position in the preparation for the future of the students and is associated with several specific decisions concerning both the substance and the process. Learning to receive and process feedback, usually from multiple (and sometimes conflicting) sources, is a crucial part of the student's professional development. It is therefore important for the students to recognize, detect, and process the differences in feedback towards developing a product (thesis, research project) that complies with the rigor of judgment and standards of the scientific inquiry.

This sub-project aimed to investigate several questions concerning the feedback provided to and received by bachelor and master students while working on their thesis project. Bachelor and master students were considered as self-regulated learners, given the expectation that the students in academic universities develop themselves as independently working professionals. The inquiry was guided by questions such as “What are the experiences and approaches used to provide feedback to students in the bachelor and master theses phase?”, “How to provide feedback to develop and supervise *self-regulated learners*?”, “How to *integrate multisource feedback* in the supervision of students?”, “What role plays Peer-feedback: *content, process* or both?” The project sought to develop an overview of the different forms of feedback provision to the self-regulated learners in different stadia of their educational careers (bachelor and master), with possible learning points towards acquiring the skills for life-long learning.

5.1 Teacher opinions and experiences

The teachers who participated in the interviews usually have experience in supervising both bachelor and master students.

“[…] There are many different levels in which you give feedback to a master student and complete different process when you give feedback to a bachelor student. For the master's student there is also usually a research element in the thesis. And you have to say give feedback to prepare the student also as an academic, as someone that has done research work, as a colleague.”(Teacher 1)

The core difference seems to be indicated in terms of the focus of supervision process: more on the content and steering at bachelor level, whereas at master level the focus the process, coaching, professional development plays a higher role:

“So, you have to give feedback at different levels and not only on the product that is produced, but also on how the students act or find his or her voice in the university and so on.” (Teacher 1)

"In my opinion, the master thesis project requires students to show more independent behavior and they have to plan a bit more, think a bit further ahead. […] Still, I got the feeling that differences between bachelor and master are not that big. Differences might be a result of personal characteristics or type of students instead of having to do with differences in bachelor and master theses." (Teacher 3)

"*The distinction is that at master's level, I treat students more as starting professionals. Because the other year they probably will apply for a job. So my feedback is more based on the skills, on their behaviors upon their career."* (Teacher 5)

There are additional differences in terms of how the supervision of a thesis is organized in different programmes. Master theses are usually organized at individual level, and the individual discussion (either through regularly scheduled meetings or through feedback in writing) are the common standard. At bachelor level there is more variation. The thesis is, again, individual, but some programmes organize bachelor theses in circles, where several students work- individually- at research topics which are derived from a common theme proposed by the teacher. The supervisory meetings are in group setting. The students also learn from each other, and they can also provide feedback to each other. These organizational differences usually have an impact upon the feedback provision approach, as indicated by one teacher:

"The biggest distinction is that in the bachelor we work in circles. So, there is a lot of let's say peer feedback, but it's more a side effect because you discuss everything in groups. I am not discussing anything with individual students. So, feedback is given and discussed in a group meeting. This year we had them, of course, online. It's very effective. But what you also see is that thesis look like each other because students learn from each other. That is that's the effect. But it's a very also efficient way." (Teacher 5)

Next to the focus on autonomy and independent judgment (at master level), the core aspect mentioned by practically all teachers interviewed refers to the preoccupation for conveying the

students a solid understanding of the scientific approach and the scientific relevance of the work done in the thesis. While this is the core task of academic education, the teachers indicate that sometimes students need a bit more support to understand that they also actually contribute to the development of science in their fields of choice. Several teachers indicate that sometimes, the students who pursue pre-master (indicating that they switched fields or continue their education from a prior degree from the university of applied science) seems to require more attention in that respect.

"I can see clearly that applied science students need much more feedback, despite the fact that in the pre master they are sort of taught on how to do stuff, I can still see that they have difficulties while they come into the program. It depends a bit on what they're going to do. If it's purely focused on academic research, then they need even more feedback. But they also seem to have difficulties that at the moment they are working for a company solving of business problems and are working in the office. They start to enjoy the work much more than the research. So I also have to make sure that they are not, let's say, forgetting the priorities on what they are doing." (Teacher 6)

"The program of the premaster is of course a bit shorter. It becomes clear that our bachelor students have received a training of three or more years in developing a research-mindset. They are able to ask themselves relevant questions, like the why-question. 'Which knowledge and existing resources am I able to connect to the current situation'. 'Can I find similarities to my own research?' 'How can I improve my own research based on this evidence?' "(Teacher 7)

Also in these situations, a higher level of steering on behalf of the teacher is required in order to make sure that the standards are achieved.

The interviewed teachers use a broad palette of approaches when supervising graduation theses. These include systematic discussions (usually planned in advance), use of written materials as the basis for the feedback, and an increasing packet of own experiences in terms of supervision techniques. There seems to be an increasing awareness of the different parameters for supervision among the programmes, both within BMS faculty and across the different faculties of the UT.

5.2 Student opinions and experiences

The students who answered the survey indicate that their programmes encourage them to conduct their graduation thesis working to an external assignment, both at bachelor level

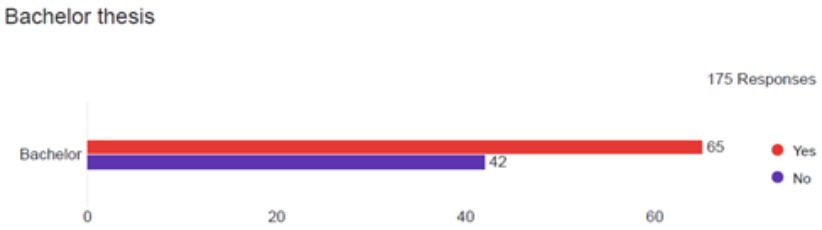

Figure 11. *Bachelor programme students reporting that their programme encourages them in pursuing an external thesis assignment*

As well as at master level:

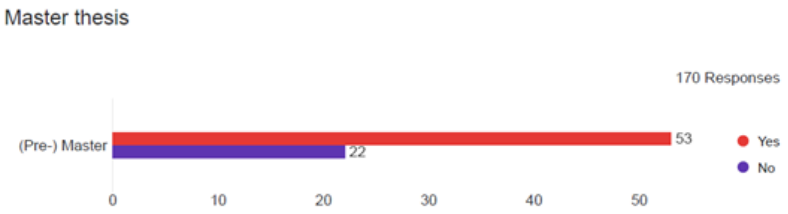

Figure 12. *Master programme students reporting that their programme encourages them in pursuing an external thesis assignment*

They also indicate a strong preference to conduct their thesis as part of an external graduation assignment by another organization both at bachelor and at (pre)master level.

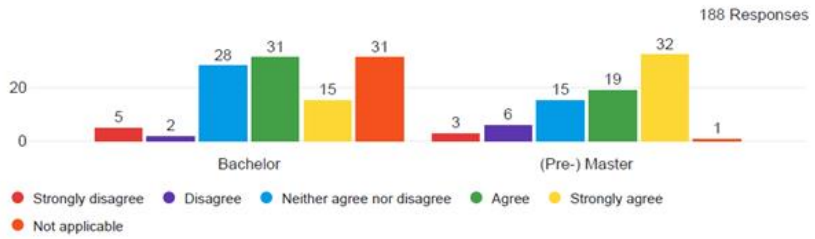

Figure 13. *Bachelor and (pre)Master students who indicate preference for conducting an external graduation assignment*

The students also indicate that they experience difficulties in combining feedback from different sources, both from different supervisors at the university (57 out of 190 responses), as well as the feedback from external supervisors with the feedback from the university (49 out of 190 responses). When asked about sources of help to address difficulties regarding the thesis, the students consistently indicate the UT supervisor and Friends/fellow students as sources of support.

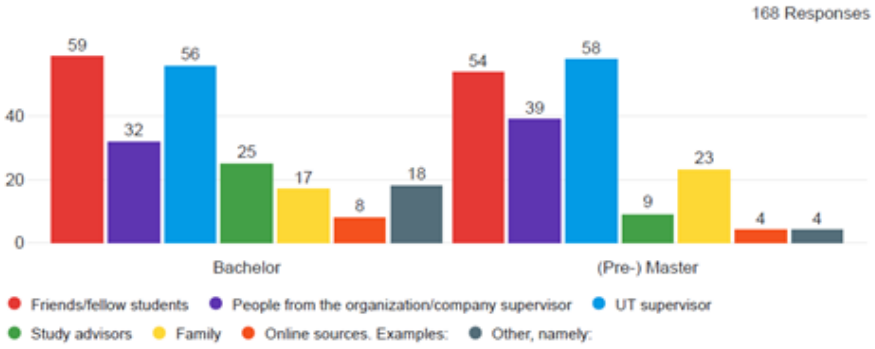

Figure 14. *Bachelor and (pre)master students indicate the sources of support while working on the thesis*

The students seem to be quite open towards conducting an external assignment for the thesis work, and the programmes also support that option. Generally, the students seem to prefer assignments in the private sector (see Appendix B), which is explicable due to the profile of the programmes. It is positive to observe that they indicate UT supervisors and Friends/fellow students as sources of support during the thesis work. However, quite a high number indicate difficulties in processing feedback from

diverse sources, which suggests that there is still space to improve the way students learn to cope with conflicting feedback.

5.3 Reflection

Writing a bachelor or a master thesis represents a very important step for the educational and career development of a student. It comes together with a set of responsibilities regarding the choice of topic, conducting research, writing the report, managing expectations and the relationship with the supervisor(s). For teachers, such a complex setting requires usually a delicate balance of feedback on content and of process and depends on professional experience. For students, the thesis project implies a conscious effort of integrating theoretical elements learned throughout the study (from a content point of view) and applying scientific theory to solve a research problem and, secondly, learning to manage the project, feedback, and the expectations from diverse sources. Three core learning points resulted from the project:

There is a high level of diversity regarding the experiences with providing feedback to students in the bachelor and master theses phase. These experiences differ with the level of study (bachelor students require a different level and focus of supervision than master students), with the level of professional experience of the teacher (experienced teachers tend to indicate a broader range of approaches and techniques used) and with the characteristics of the student (level of motivation and engagement, student's educational background).

The integration of feedback seems to be considered part of the student's responsibilities. There is less information available to what extent students are made aware and prepared consciously to integrate feedback from multiple sources, and how to address possible competing information. Using scientific theory and methodological approaches to justify choices are the core requirements content-wise, but expectation management has a rather implicit role in the process.

Peer-feedback plays a dual role in the thesis process, both in terms of content as process. The students do report relying primarily in UT teachers and on Friends/fellow students for the thesis. At bachelor level, peer feedback seems to be explicitly present in programmes where the thesis is organized in a circle (group) setting, and where students are asked to provide individually feedback to their peers.

6. Feedback for multidisciplinary groups of students

In the educational programmes of the UT, group work plays an important role. The bachelor's programmes are based on the Twente Educational Model (TEM). An important component of all modules in the bachelor's programmes is a project, in which students usually work together in small teams on a practical assignment, applying the knowledge and skills they have gained in other parts of the module (see, https://www.utwente.nl/en/tom/whatistom/). In the UT's master's programmes, students are also regularly asked to work on assignments in small groups. With the upcoming introduction of Challenge Based Learning (CBL) as a teaching approach in the master's programmes, teamwork will become an even more significant part of these programmes. In a CBL environment, students decide about the problems they would like to work on and try to get the necessary skills and knowledge. They work in teams of students with, preferably, diverse characteristics (see, https://www.utwente.nl/en/ces/celt/toolboxes/Challenge%20Based%20Learning/).

In both teaching approaches, TEM and CBL, diverse student teams are preferred, so students with a different background, and with different knowledge and competencies can learn from each other. These heterogeneous, or multidisciplinary groups may have different needs and wishes related to feedback than homogeneous, or monodisciplinary groups. However, literature about how teachers can provide optimal, customized feedback to heterogeneous, multidisciplinary groups and how students in multidisciplinary groups can provide their peers with useful feedback is relatively scarce. Our exploratory approach to this topic, has given us new insights in the needs for feedback of student groups with different compositions. In the next sub-sections, a brief overview of the literature is

presented, followed by insights gained from teachers that we interviewed and results from the survey among students. This section ends with a brief reflection on how to optimize the use of feedback when working with multidisciplinary groups.

Multiple definitions of multidisciplinarity exist, and next to multidisciplinarity other related terms are used, such as interprofessional and interdisciplinary. For the sake of clarity in this exploratory study, we have chosen to only use the term “multidisciplinary groups” and to use the following definition: Teams consisting of students who are studying in different study programmes or are a mixture of students at the University of Twente or other national or international universities.

A considerable amount of literature has been published about the importance for students to learn to work in multidisciplinary teams and the positive effects of this learning process on their personal development and their readiness to start working in a profession. However, these studies also indicate that it may be difficult to learn how to work effectively in a multidisciplinary team. In an often-cited study, Van der Vegt and Bunderson (2005) show that only in teams with a high collective identification, the diversity of the team members had positive effects on team learning and on their performance. Hero and Lindfors (2019) did an extensive case study in which they described and measured students’ learning performance in multidisciplinary teams. The results show positive effects of working in a multidisciplinary team, but the researchers also states that the role of the teacher in guiding the students is crucial. Fleischmann (2015) also concludes that it is beneficial for students to participate in multidisciplinary teamwork, but that students should participate multiple times in multidisciplinary projects to learn how to effectively work in a team. The three examples indicate that being able to work as a valuable member of an effective multidisciplinary team requires practice and guidance.

Other studies demonstrate that students consider learning to work in multidisciplinary teams as important (for example, Strong, 2012), and moreover, that they find it important to receive feedback when participating in multidisciplinary projects. Participants in the study of Prins et al. (2005) indicated that they valued formative peer assessment in their projects and students who participated in the

study of Burgess et al. (2020) stated that feedback from their project facilitators was important for their learning process. Apart from these indications that providing feedback to students in multidisciplinary groups is important, literature about the precise role and effects of feedback in these projects is scarce. Therefore, we have asked teachers at the UT who have experience with supervising multidisciplinary group work how important they consider feedback to be in these projects, in comparison to the role of feedback in other, monodisciplinary projects.

6.1 Teacher opinions and experiences

Most teachers we interviewed reported to have at least some experience with multidisciplinary education. Overall, they consider multidisciplinarity important, but they did not have outspoken opinions about the differences between teaching to mono- or multidisciplinary groups:

"I think if it is group work it does not really make a difference what kind of group it is. Whether it is multi or some other kind of disciplinarity so that does not really matter." (Teacher 10)

Some of them told us that they have positive experiences with multidisciplinary groups, because they saw that students with different backgrounds complemented each other well, and that this led to better project results.

"Yes, sometimes we have chosen to deliberately divide them (UT minor students who participated in a module of another bachelor's programme). Then, it becomes clear that they have a different study attitude. I think that overall, this works out positively; the idea of composing groups of students with different background and different opinions." (Teacher 8)

"These two groups of students complement each other well (students in two different master's programmes). So, yeah, I think that I will make it compulsory to work in mixed groups. That may work out well." (Teacher 3)

Although teachers indicated that multidisciplinary student groups have several advantages over monodisciplinary groups, most teachers did not seem to have very clear ideas about how to guide the multidisciplinary groups so they could benefit most from their different backgrounds. A few teachers did indicate that they use different methods to promote multidisciplinary working and that they consciously stimulate students to use ideas related to their different backgrounds, with satisfactory results.

"So that you have all kinds of methods in order to stimulate multidisciplinary or interdisciplinary working. And then they must also stimulate students trying to bring in their ideas based on their background knowledge. You have to steer it. Now it goes quite, let's say, organically. I don't know, it's a black box to me. And in the final assignments, I see, of course, that all backgrounds are to some extent represented. It's a kind of mixture of these different perspectives." (Teacher 5)

Related to feedback, most teachers told us that they do not use different strategies for providing students in a multidisciplinary course or project group. Some of them did give other types of feedback to students with different backgrounds, mostly with regard to the content of the feedback, so that all students had sufficient knowledge about the specific assignment they were working on.

"Yes, possibly, but unconsciously. Actually, I should take a closer look at that. I teach that specific course that is very strongly related to the profession related to our own study programme. And I do think that I give more and different feedback to students from other study programmes. (Teacher 9)

A few teachers indicated that they saw differences between students with specific backgrounds that asked for different types of feedback related to the learning process. One of the teachers explained that students with a technical background need on average somewhat more encouragement to be able to provide their peers with feedback than non-technical students.

"So, the students with a technical background, I always have to push them a bit, because they'll just give very short answers and only after I push them a bit and make sure that I sort of get the feel that they need to talk more about it. That's when that will happen. The other group, the non-technical, at

times I had to slow down a bit. So, there is certainly a difference in the way and how these two groups think and provide feedback for the peers." (Teacher 6)

Overall, it seems that the teachers we interviewed valued multidisciplinarity, but they did not have very clear opinions or ideas about specific feedback mechanisms for multidisciplinary student groups.

6.2 Student opinions and experiences

The section on multidisciplinary groups in the survey, started with the question how often students have participated in multidisciplinary group work. The concept 'multidisciplinary group' was explained as: consisting of students from different study programmes or from the same programme but form different universities. Somewhat less than half of the students answered that they had never participated in multidisciplinary group work, about the same number of students reported that they had done this once or twice, and less than 20% of the students answered that they had done this three times or more. So, although multidisciplinary group work is quite common in the bachelor's programmes, a relatively high percentage of the students reported to have no experience with this yet. The pattern among the master's students is different: a bigger part of the students has experience with multidisciplinary group work. Only about a quarter of the students reported to have never participated in multidisciplinary group work. About half of the students who answered that they have experience with multidisciplinary groups, have participated in multidisciplinary group work once or twice, the other half reported to have participated in multidisciplinary group work three times or more.

After having answered the question about how often they had participated in multidisciplinary group work, students were asked two series of questions about feedback when working in groups, one series about receiving feedback from several others and one series about providing feedback to their peers. In both series, working in monodisciplinary groups was compared to working in multidisciplinary groups. The students had to answer all questions on a five-point scale from "strongly agree" to "strongly disagree". No opportunities for providing written comments were offered.

The answers to the first series of questions showed that, overall, students consider receiving feedback about group work in multidisciplinary teams as somewhat more important than when they work in monodisciplinary teams. This holds for feedback from different sources: teachers, company representatives and peers. Additionally, it holds for feedback about the group work as well as for feedback about their individual contributions to the group work. The answer patterns of bachelor's and master's students are similar. Figure 15 shows the typical answer pattern to all questions in this series.

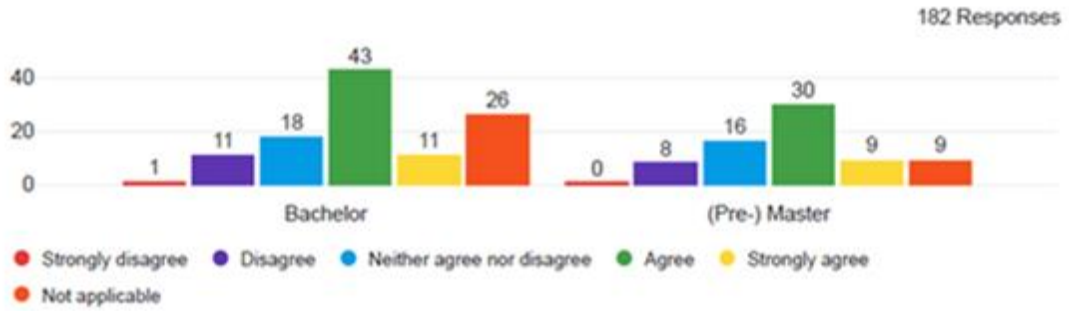

Figure 15. *Students' answers to the question: "Compared to working in a monodisciplinary group, in a multidisciplinary group, it is more important to receive feedback from the teacher(s) about the group work.*

The answers to the second series of questions show that students find it more difficult to provide their peers with feedback when working in a multidisciplinary group than when working in a monodisciplinary group. Next to that, it costs them more time to provide feedback, and they find it more difficult to predict if their feedback is helpful (see Figure X). Again, the answers of the bachelor's students are similar to the answers of the master's students. The answers to the question about whether they feel that their feedback is more helpful in multidisciplinary groups is less clear: master's students seem to think that this is the case, while many bachelor's students answer that they neither agree nor disagree with this statement.

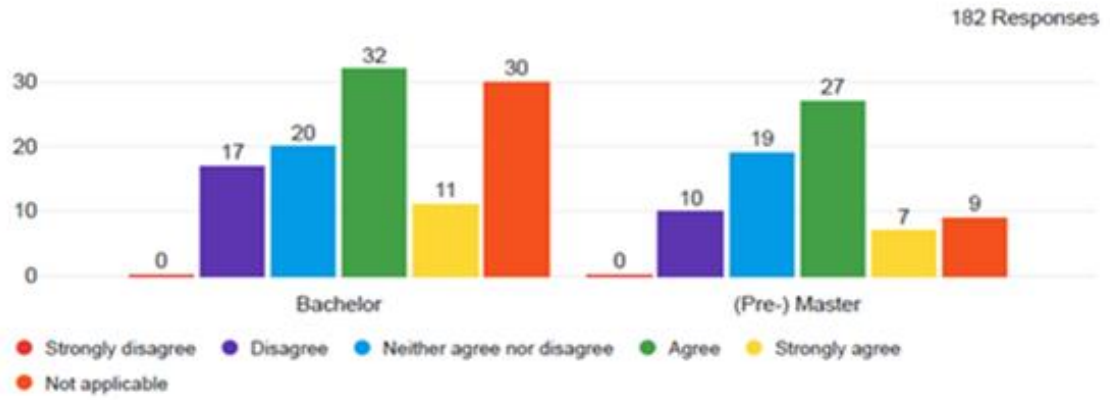

Figure 16. *Students' answers to the question: "Compared to working in a monodisciplinary group, in a multidisciplinary group, I find it more difficult to predict if my feedback is helpful for my peers".*

Overall, it seems students have different needs for feedback when working in multidisciplinary groups than in monodisciplinary groups. Although it is difficult to interpret their answers without having written explanations, it seems students are more insecure about multidisciplinary group work than about monodisciplinary group work. They consider receiving feedback as more important and they find it more difficult to provide their peers with feedback. Based on these results, teachers may consider adapting their feedback mechanisms to the composition of student groups.

6.3 Reflection on feedback for multidisciplinary groups of students

Although multidisciplinarity is important in the UT's educational programmes and although students consider feedback as more important when working in multidisciplinary groups, teachers seem to lack some knowledge about how to optimally make use of feedback when teaching multidisciplinary groups. Based on all information collected in this study and based on own experiences, we think that it is important for the community of teachers to first gain more knowledge about multidisciplinarity in general. More attention for what 'multidisciplinary' means and for its implications is even more relevant than previously with the introduction of Challenge Based Learning (CBL) as a teaching approach in the master's programmes.

In the interviews, we have not asked teachers about the content of their education for multidisciplinary groups, but implicitly, it became clear that teachers did not always realize that to optimally make use of the different backgrounds of students, the assignments that the students have to make should be multidisciplinary. It should be necessary to combine knowledge or skills from different disciplines to be able to complete the assignment. When this is the case, students can contribute equally. So, if teachers would like to work with multidisciplinary groups, the content of their course or their assignments should be adapted to this.

New feedback mechanisms need to be developed for multidisciplinary assignments in which students have to combine knowledge from different disciplines. Literature about this topic is scarce. Previous studies show that the role of the teacher in multidisciplinary assignments is important because students need guidance when working on these types of assignments, but not much is known about how to make optimal use of feedback. As a first step in gaining more knowledge, teachers should share their experiences with multidisciplinary groups working on truly multidisciplinary assignments. Based on these experiences, they can develop feedback mechanisms that seem to be specifically useful for these types of assignments. The next step then would be to use these mechanisms in their courses, and to improve them together with the students who participate in the courses.

7. Co-creation of assessment criteria and rubrics

An important prerequisite for peer feedback to be successful for students' learning is the level of students' engagement and involvement in the feedback process (e.g., Hattie & Timperley, 2007). One way to make students explicitly part of the process is to involve them in the creation of the rubrics that are used to provide the formative or summative feedback. In this subproject, we have *explored* the role that students can play in formulating rubrics for both formative and summarize assessment, the support that students might need to formulate a rubric that balances the learning objectives and

learning possibilities as perceived by themselves, and the positive effects that the creation process might have on students' engagement and achievement.

Co-determining assessment criteria for their own learning process could be seen as part of the self-regulative learning process (Pintrich, 2004). It allows students to monitor, control, and evaluate their own or their peers' learning process. Involving students in the process of co-creating parts of their own curriculum is known to result in higher degrees of student satisfaction (Elsharnouby, 2015), to foster conditions for well-being, care, and interconnectedness (Taylor & Bovill, 2018), to facilitate self-reflection (Tee & Ahmed, 2014) and is critical to study success (Cockett & Jackson, 2018). What we do not know yet is whether engaging students in the process of creating assessment rubrics, in specific, is equally valuable and desirable.

7.1 Teacher opinions and experiences

The interviews with the teachers showed that most of them did not have experience with engaging students in the process of creating assessment criteria and rubrics. For most teachers this was not the result of unwillingness or based on a negative attitude towards the activity. Instead, they indicated that they do not know how to successfully implement this in the regular assessment procedure.

The few teachers who indicated to have engaged in co-creating rubrics with students indicated that they see benefits for the students' learning process. They have indicated it to be especially beneficial to increase students' understanding of the skills and/or knowledge they needed to obtain during the course or module.

> *"We are not there yet. But we definitely need to include students in this process. It is in line with our vision on self-directed learning and what that entails."* (Teacher 11)

At the same time, however, teachers do seem to view it as an *additional and optional part* of the feedback and assessment process.

"Yeah. Like it's kind of a bonus. I feel that they also feel that it is a bonus because it is really clear what they are going to design and what their design will be assessed on. So, I think they like it. But still it can be improved. I mean the process can be improved." (Teacher 2)

Even though the added value of engaging students in the process of co-creating rubrics is endorsed by the teachers, it was also mentioned that this process is time consuming. The costs do not always seem to outweigh the benefits in the sense that it was indicated by some of the teachers that it is necessary for the teacher to check the rubrics that have been created by the students in order to make sure that the assessment criteria are in line with the learning objectives of the course and the program.

"One of the things that I was thinking is that I should check the rubrics, but that is really time consuming. I do not want to do it. And also, when I check the rubrics and then I say, OK, there are not good criteria, it feels like I am intervening in their creation process. […] But on the other hand, when the rubric is not clear, then it also affects their grade. But then they should also be able to do it themselves. I gave them some examples what a good rubric looks like. I do not know how to improve this process. So, if you have any suggestions..." (Teacher 2)

Furthermore, teachers indicated to have doubts about students' ability to identify good and relevant assessment criteria. This issue has more than once been indicated as the main reason to not engage in the process of letting students contribute to the creation of the assessment criteria.

"Students do not have the broader overall picture of the whole program. They think about what is of interest to them but not necessarily to the whole group. And what I consistently see is that the majority of the input given by students is not necessarily helping the quality of the program. That sounds a bit harsh, but this is also my experience." (Teacher 9)

At the same time, however, the issue of students not knowing how to create good and valid assessment criteria is not always seen as a reason not to integrate students in the process of creating the criteria. Instead, it has been stressed that students need to be trained in how to create relevant assessment criteria – and that it will help them to provide proper feedback themselves.

"Students need to be supported in how to create a rubric. They need to know what a good rubric looks like." (Teacher 1)

"Yes, to co-create a rubric, you need to invest time and effort in making sure that students know how to create good quality criteria." (Teacher 2)

7.2 Student opinions and experiences

Students' opinions have been gathered by means of a questionnaire. Three main outcomes are relevant to discuss that demonstrate students' opinions (and possible experiences) with the co-creation of rubrics and their application in their educational program. However, these outcomes should be read in the light of the fact that students indicated that they lack experience in the process of co-creating rubrics and/or assessment criteria (see Figure 17). Even though they indicated that they all participated at least once in an activity in which they were asked to co-create assessment rubrics, their experience did not go beyond that one experience.

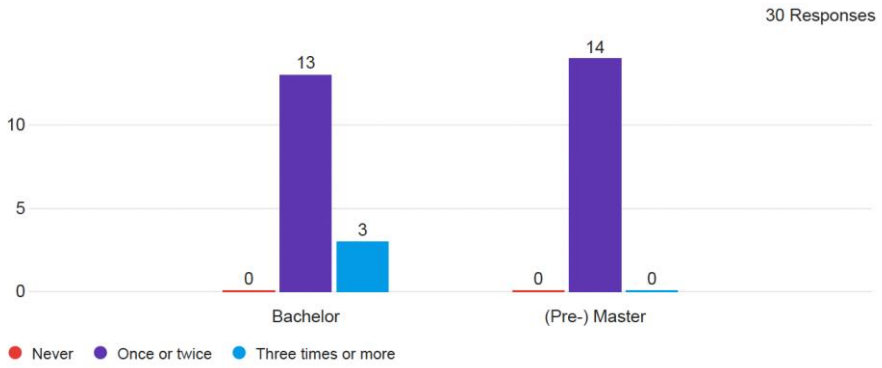

Figure 17. *Students' experience in co-creating assessment rubrics*

First, the results of the questionnaire demonstrated that students believe that participation in the development of assessment criteria will give them more insights in the grading of the assignment and that, therefore, the assignment becomes clearer (see Figure 18). Furthermore, students indicated that

being involved in co-creating the assessment criteria also increases their self-efficacy (i.e., feelings of capability to complete the assignment with a good grade; see Figure 19).

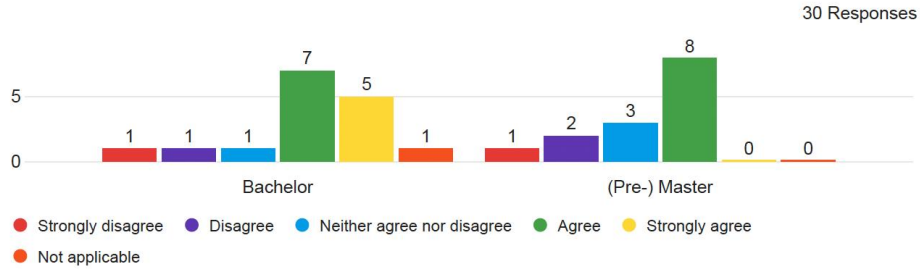

Figure 18. Students' opinion on the clarity of assignments due to co-creating rubrics

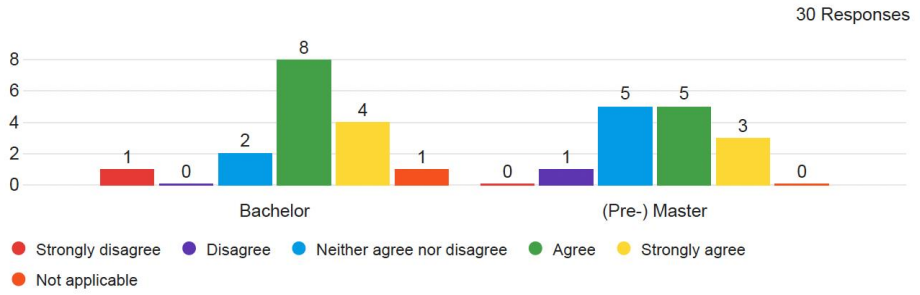

Figure 19. *Students' feelings of capability so successfully complete an assignment due to involvement in co-creation of rubrics*

Second, students indicated that co-creating assessment criteria will make them feel more engaged in the course. It will provide them with more insight in the expectations about their performance in light of the learning objectives (see Figure x).

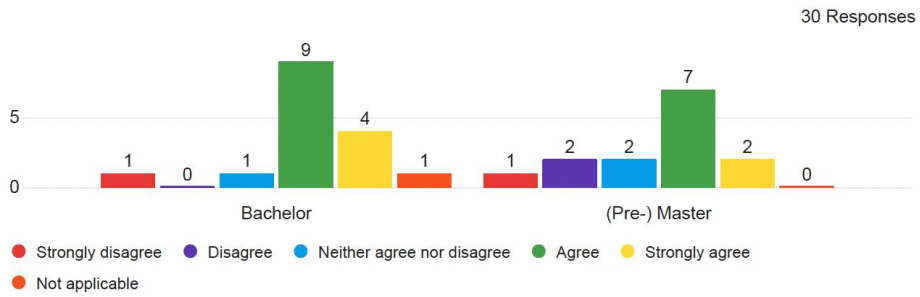

Figure 20. *Students' opinion on feelings of engagement due to being involved in the process of co-creating rubrics*

Third, students believe that participation in the development of assessment criteria will help them in providing feedback to others (i.e., peer feedback; see Figure 21).

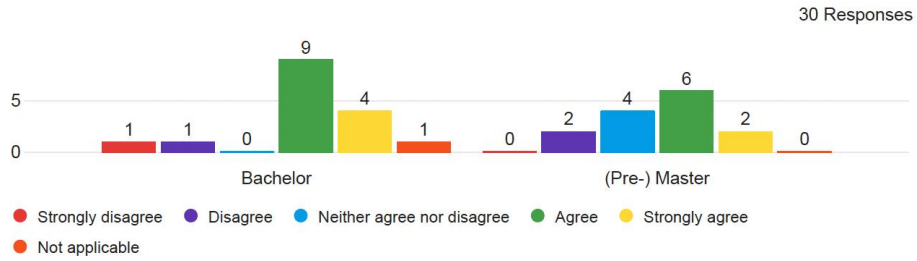

Figure 21. *Students' opinion on providing peer feedback with the help of participation in co-creating assessment criteria*

And fourth, students believe that teachers should manage the co-creation process (see Figure 22). In line with this, students were asked to indicate to what extent they felt confident about co-creating assessment criteria and rubrics themselves. The outcomes showed that they are moderately confident that they can construct high-quality assessment criteria (see Figure 23).

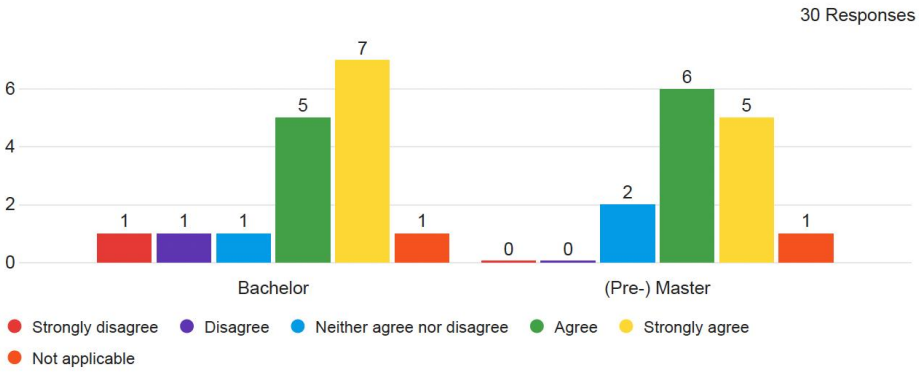

Figure 22. *Students' opinion on the importance of the teacher managing the process of co-creating rubrics*

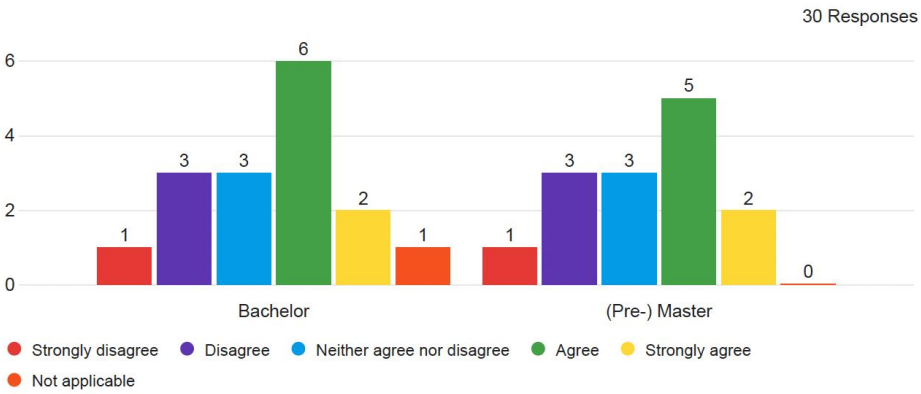

Figure 23. *Students' confidence in co-creating high-quality assessment criteria themselves*

7.3 Reflection on co-creation of rubrics

In this sub-project, it was explored to what extent teachers and students have experience with and see the added value of co-creating assessment criteria and rubrics. The emphasis was placed on the 'co' of co-creation, as it should be seen as a shared activity between teachers and students. Wherein students get the freedom to provide input for and formulate assessment criteria within the boundaries that are placed by the teachers (depending on the learning objectives of the module or course and their expertise). The idea behind involving students in the process of co-creating assessment criteria is that it should increase their understanding of the to-be-performed task. This should, in turn, support them to understand received feedback better (by teachers and/or peers) and allow them to provide more informative feedback to others themselves (i.e., peer feedback). The latter was corroborated by the students in the questionnaire.

The results of both the teacher interviews and the student questionnaire showed that student involvement in the process of co-creating assessment criteria and rubrics is not a common activity yet. Teachers indicated that they do see the possible benefits of engaging students in this process. However, they feel that students need to be trained in order to have a valuable contribution to the process of co-creating assessment criteria and rubrics. Students have indicated to see the added value of their engagement in this process as well. They, however, stated that they do not feel comfortable

and confident to create these assessment criteria themselves. The outcomes of both teachers and students suggests that the 'co' in co-creation is indeed a relevant addition. It seems to be about finding the right balance between the input that students can provide within the context that is created by the teacher (e.g., course objectives and training/assistance).

If teachers want to involve students in the process of co-creating assessment criteria and rubrics, there are three suggestions that follow from the current exploratory research. First, students need to be trained how to formulate high-quality assessment criteria that make sense within the context of the course objectives. One way to train students is through discussing exemplars of student work, which allows them to gain insight in what high-quality assignments look like (e.g., Carless & Kam Ho Chan, 2017).

Second, to make sure that students feel comfortable about participating in the co-creation process, it is important to create a situation in which students actually 'co'-operate with the teachers. This could be established by arranging one or smaller focus group meetings with the teachers present in which the assessment criteria are formulated together, or by providing students with necessary feedback (and checks) on their formulated assessment criteria. Basically, the teacher should play a visible and clear role in the creation process, which makes it co-creation.

And third, co-creation of assessment criteria is a valuable addition to peer feedback processes. It does not only allow students to get more familiar with the assignment requirements, and thus the related assessment criteria, but it also leads to higher quality peer feedback as the students are likely to be more involved in the assessment process.

8. Conclusion

To understand the need of students for feedback and for optimal feedback mechanisms, in this report we aimed to provide an overview of various feedback mechanisms and to explore how they could be

used for various groups of students and teaching activities. To do so, we looked at five different feedback mechanisms that are proven to enhance learning experiences and performance outcomes of students. These feedback mechanisms were peer feedback, multisource feedback in a process of 360-degree peer feedback, feedback for self-regulated learners in their bachelor and master thesis, feedback in multidisciplinary groups of students, and development of assessment criteria for feedback through co-creation of assessment rubrics. These mechanisms help to develop student behaviours that fit the requirements of the University of Twente for the development of global citizens with an entrepreneurial mindset who contribute to connected communities through collaboration with society.

Providing an evidence-informed overview of the feedback mechanisms based on the academic literature, we investigate best feedback practices based on interviews with 13 enthusiastic UT teachers and student needs and expectations for feedback based on a survey of 289 BMS students. Our results show that although our students and teachers are open to new feedback mechanisms and see their potential benefits, these feedback mechanisms are not yet used by many UT teachers in their educational activities. That means that feedback at BMS is rather teacher-driven and although external stakeholders may play a role as guest lecturers of bachelor/master theses supervisors, these stakeholders are rarely involved in feedback processes to improve student learning. There are also only a few examples of peer feedback practices and although teachers stimulate their students in self-assessment of their own work, this form of feedback is only occasionally integrated into a holistic feedback process for student learning. Knowing that challenge-based learning is high on the educational agenda of the University of Twente and that multidisciplinary teamwork is an integral part of challenge-based learning, we feel that BMS teachers are ill-prepared to provide feedback outside their own expertise area to students of other disciplines or in multidisciplinary teams. We also know that engaging students in the development of assessment rubrics helps students to perform the required tasks and reach desired learning goals and that the development and usage of assessment

rubrics is a central element of all feedback practices. However, we needed to conclude that BMS teachers are not yet comfortable to co-create assessment criteria with their students.

This research has reassured us that BMS teachers and students are open for new feedback mechanisms and willing to learn how to apply them. Therefore, we provided several suggestions about ways to train teachers (train the trainer) to integrate more student-centred feedback mechanisms in their teaching activities that help students' learning processes. When teachers have learned to integrate other feedback sources and mechanisms next to the expert-feedback they can provide themselves and to engage students more in their own learning through peer feedback and co-creation, they can start to train their students about how to provide and receive feedback from various sources and through various mechanisms. We believe that good feedback starts with and is based on good assessment criteria and rubrics. Besides this, engaging students in their curriculum improves learning. Therefore, we also encourage teachers to co-create assessment rubrics with their students, which can be used for self-assessment, peer feedback, teacher feedback and stakeholder feedback in various educational activities.

9. References

Atwater, L. E., Brett, J. F., & Charles, A. C. (2007). Multisource feedback: Lessons learned and implications for practice. *Human Resource Management, 46*(2), 285-307.

Burgess, A., Kalman, E., Haq, I., Leaver, A., Roberts, C, & Bleasel, J. (2020). Interprofessional team-based learning (TBL): How do students engage? *BMS Medical Education, 20*(1).

Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, *65*(3), 245-281.

Campion, M. C., Campion, E. D., & Campion, M. A. (2015). Improvements in performance management through the use of 360 feedback. *Industrial and Organizational Psychology*, *8*(1), 85-93.

Chu, A. & Westerheijden, D.F. (2018) Between quality and control: what can we learn from higher education quality assurance policy in the Netherlands, *Quality in Higher Education*, 24:3, 260-270,

Cockett, A., & Jackson, C. (2018). The use of assessment rubrics to enhance feedback in higher education: An integrative literature review. *Nurse Education Today, 69,* 8-13.

Dochy, F. J. R. C., Segers, M., & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: A review. *Studies in Higher Education*, *24*(3), 331-350.

Elsharnouby, T. H. (2015). Student co-creation behavior in higher education: The role of satisfaction with the university experience. *Journal of Marketing for Higher Education*, *25*(2), 238-262.

Fleischmann, K. (2015). A successive approach to multidisciplinary teamwork in undergraduate design education: From dysfunctional to functional teams. *Arts and Design Studies, 37*, 25-35.

Galan-Muros, V., & Davey, T. (2019). The UBC ecosystem: putting together a comprehensive framework for university-business cooperation. *The Journal of Technology Transfer*, *44*(4), 1311-1346.

Gibbs, G., & Simpson, C. (2004). Does your assessment support your students' learning. *Journal of Teaching and Learning in Higher Education*, *1*(1), 1-30.

Gielen, S., Peeters, E., Dochy, F., Onghena, P., & Struyven, K. (2010). Improving the effectiveness of peer feedback for learning. *Learning and Instruction*, *20*(4), 304-315.

Hattie, J. (1999). Influences on student learning. *Inaugural lecture given on August*, *2* (1999), 21.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81-112.

Hensel, R., Meijers, F., van der Leeden, R., & Kessels, J. (2010). 360 degree feedback: how many raters are needed for reliable ratings on the capacity to develop competences, with personal qualities

as developmental goals?. *The International Journal of Human Resource Management*, *21*(15), 2813-2830.

Hero, L.-M., & Lindfors, E. (2019). Students' learning experience in a multidisciplinary innovation project. *Education + Training, 61*(4), 500-522.

Hounsell, D. (2003). Student feedback, learning and development. *Higher education and the lifecourse*, 67-78.

Hounsell, D., McCune, V., Hounsell, J., & Litjens, J. (2008). The quality of guidance and feedback to students. *Higher Education Research & Development*, *27*(1), 55-67.

Huisman, B., Saab, N., van den Broek, P., & van Driel, J. (2019). The impact of formative peer feedback on higher education students' academic writing: a Meta-Analysis. *Assessment & Evaluation in Higher Education*, *44*(6), 863-880.

Knight, P. T., & Yorke, M. (2003). Employability and good learning in higher education. *Teaching in Higher Education*, *8*(1), 3-16.

Li, H., Xiong, Y., Hunter, C. V., Guo, X., & Tywoniw, R. (2020). Does peer assessment promote student learning? A meta-analysis. *Assessment & Evaluation in Higher Education*, *45*(2), 193-211.

McGourty, J., Dominick, P., Besterfield-Sacre, M., Shuman, L., & Wolfe, H. (2000, October). Improving student learning through the use of multisource assessment and feedback. In *30th Annual Frontiers in Education Conference. Building on A Century of Progress in Engineering Education. Conference Proceedings (IEEE Cat. No. 00CH37135)* (Vol. 1, pp. F1A-7). IEEE.

Mory, E. H. (2004). Feedback research revisited. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology* (pp. 745–783), Lawrence Erlbaum Associates Publishers.

Mulder, R., Baik, C., Naylor, R., & Pearce, J. (2014). How does student peer review influence perceptions, engagement and academic outcomes? A case study. *Assessment & Evaluation in Higher Education*, *39*(6), 657-677.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199-218.

Nicol, D., Thomson, A., & Breslin, C. (2014). Rethinking feedback practices in higher education: a peer review perspective. *Assessment & Evaluation in Higher Education*, *39*(1), 102-122.

Pintrich, P.R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychological Review, 16,* 385-407.

Plewa, C., Galán-Muros, V., & Davey, T. (2015). Engaging business in curriculum design and delivery: a higher education institution perspective. *Higher Education*, *70*(1), 35-53.

Poulos, A., & Mahony, M. J. (2008). Effectiveness of feedback: The students' perspective. *Assessment & Evaluation in Higher Education*, *33*(2), 143-154.

Prins, F. J., Sluijsmans, D. M. A., Kirschner, P. A., & Strijbos, J.-W. (2005). Formative peer assessment in a CSCL environment: A case study. *Assessment and Evaluation in Higher Education, 30*(4), 417-444.

Ramsden, P. (2003). *Learning to teach in higher education*. Routledge.

Stobart, G. (2008). *Testing times: The uses and abuses of assessment*. Routledge.

Strong, D. S. (2012). An approach for improving design and innovation skills in engineering education: The multidisciplinary design stream. *International Journal of Engineering Education, 28*(2), 339-348.

Taylor, C. A., & Bovill, C. (2018). Towards an ecology of participation: Process philosophy and co-creation of higher education curricula. *European Educational Research Journal*, *17*(1), 112-128.

Tee, D. D., & Ahmed, P. K. (2014). 360 degree feedback: An integrative framework for learning and assessment. *Teaching in Higher Education*, *19*(6), 579-591.

Tessema, B. S., & Abejehu, S. B. (2017). University-industry collaboration in curriculum development: Analysis of banking and finance graduates' attributes from educators and industries perspective. *Education Journal*, *6*(2), 87-93.

Topping, K. J. (2009). Peer assessment. *Theory into practice*, *48*(1), 20-27.

Van Boxtel, C., van der Linden, J., & Kanselaar, G. (2000). Collaborative learning tasks and the elaboration of conceptual knowledge. *Learning and Instruction, 10,* 311-330.

Van der Vegt, G. S., Bunderson, J. S. (2005) Learning and performance in multidisciplinary teams: The importance of collective team identification. *Academy of Management Journal, 48*(3), 532-547.