Enhancing Goal Setting Skills by Using Goal-Directed Peer Feedback

Hanieh Hosseini Mehrpour Shafti (5709288)

Master Thesis (201600025)

Faculty of Social Sciences

Utrecht University

First Assessor: dr. Jacqueline Wong

Second Assessor: dr. Michaela Arztmann

June 8, 2023

5698 words

Abstract

As more employers expect their employees to be self-directed and self-controlled, it becomes more crucial for vocational education to provide students with the necessary skills to succeed in the workplace. One of these skills is self-regulated learning (SRL), although this might be challenging for some students, studies have shown that feedback plays a crucial role in enhancing these SRL skills. A quasi-experimental quantitative research design was used to investigate whether goal-directed peer feedback can improve students' goal setting skills. A control condition and experimental condition was set up to measure whether goal-directed feedback improved students' goal setting skills in terms of goal setting, goal content and goal attainment. Students set goals every week and could formulate new goals or revise them. Additionally, we measured students' goal setting skills in a pre- and post-test by means of a goal setting questionnaire and scored the quality of goals with a SMART-goal rubric. Results of the mixed-design ANOVA show that students who received goal-directed feedback did not show improvement on goal setting skills, goal content and goal attainment in comparison with students who did not receive goal-directed peer feedback.

Keywords: SRL, goal setting, goal-directed peer feedback, goal attainment, SMART goals

Almost one-third of the workforce in the Netherlands has a vocational education background (*Onderzoek en Informatie*, SBB, n.d.). Vocational education prepares students to enter the workforce in a specific occupation or trade by providing learning environments that stimulate the working fields to practice the skills and apply the knowledge. For example, software developer students need to be able to set feasible goals within a limited time frame to develop a website or an app for their client. Therefore, students need to be able to self-regulate their learning. Furthermore, there is a strong emphasis on promoting self-regulated learning (SRL) in vocational education to meet workplace demands. Employers expect employees to develop themselves continuously; as such the ability to self-regulate one's learning plays an important role in employability and lifelong learning (Jossberger et al., 2010; Mejeh & Held, 2022). Therefore, it is of interest to examine how SRL skills can be enhanced in vocational education.

According to Zimmerman and Schunk (2011), students who are proactive in regulating their own learning tend to do the following which improves their academic achievement; they set specific goals, use effective strategies to help them learn (e.g., taking notes, self-explaining), track their own progress towards their goals, create a positive environment for learning and believe in their own ability to learn. However, SRL requires a high level of self-awareness and self-control, which can be challenging for some students to develop (Jossberger et al., 2010). For example, some students may have difficulty setting realistic and achievable learning goals for themselves (Shute, 2008). Jossberger et al. (2010) investigated the interaction of students' individual learning behavior regarding self-directed learning and SRL and the environment they learn in. Results showed that although students were able to effectively plan and monitor their self-regulatory activities, they often struggle to successfully execute their planned actions without help and guidance from peers or teachers. Therefore, suggesting that feedback is needed to help students improve their self-regulated learning, more specifically feedback can potentially support the goal setting process. Therefore, the current study aims to explore whether goal-directed feedback

enhances students' goal setting skills. In the following section, the role of feedback on SRL will be discussed followed by a brief review of studies examining feedback on goal setting.

Feedback and SRL

Formative [1]feedback is ubiquitous in educational contexts and comes in many forms such as peer feedback, teacher feedback and written feedback (Hattie & Timperely, 2007). In addition, feedback can be given on presentations, reports, performance, a process etc. Shute (2008) argued that the primary goal of feedback is to help students improve their knowledge, skills, and understanding in a particular subject or skill. Accordingly, feedback should provide information that would assist students in bridging the gap between their current level of learning and the desired outcome and guide them to work toward their learning goals (Ashford & Stobbeleir, 2013; Clark, 2012; Hattie & Timperley, 2007; Zimmerman & Schunk, 2011).

The connection between feedback and SRL can be observed in theoretical frameworks. One such model, proposed by Butler and Winne (1995), focused on SRL, and emphasized how internal feedback and external feedback plays a crucial role. With external feedback, the student receives information from a peer or teacher that allows them to validate, supplement, replace, refine, or reorganize the information received. Then, with internal feedback, the students are enabled to reassess their task involvement and make changes or enhancements to their objectives, approaches, and strategies.

Additionally, the positive effect of feedback on SRL has been established by several meta-analysis and reviews (Neubert, 1998; Shute, 2008). One striking finding in Shute's review on feedback is that feedback is a complex process when it is too lengthy or complicated, suggesting that the characteristics of feedback should be considered (e.g., information conveyed by feedback and direction of feedback). That feedback is a complex process is underlined in a more recent work by Wiliam (2023) in which he describes that

---

[1] From this point formative feedback is referred to as feedback

feedback studies show a pattern in displaying heterogeneity, thereby rendering it difficult to draw definitive conclusions.

More recently, Wisniewski et al. (2020) conducted a meta-analysis based on 435 studies and reported an overall medium effect of feedback of students learning (d = .48). They found that high-information feedback is the most effective form (d = 0.99) of feedback on students' learning compared to corrective feedback or feedback on reinforcement or punishment. High information feedback contains information on task, process, and self-regulation, it helps the student to understand the mistakes they made, why they made these mistakes and how to avoid making the same mistakes again. Similarly, the positive effect of high-information feedback is supported by Hattie and Timperley (2007), in their review they claim that high-information feedback helps the student with their goal setting.

Therefore, feedback is a powerful way to not only enhance learning performance but also SRL as feedback plays a crucial role in this process. It enables students to ask for help when needed, to persevere, to put in effort and to use adaptive strategies to self-regulate their learning and set new goals when their goals are achieved.

Feedback on Goal Setting

Self-regulated learning (SRL) is a goal-driven process, and hence, the effectiveness of SRL can be influenced by the goals set by the students (Hattie & Timperley, 2007). Research shows that feedback adds value to goal setting (Ashford & Stobbeleir, 2013; Neubert, 1998). Neubert (1998) identified two underlying mechanisms that explained why feedback when combined with goal setting is more effective than goal setting alone. The first mechanism concerns one's self-regulatory response to discrepancy between goal and current performance. When students are able to reduce the discrepancy between their current state and learning objective, they will be motivated to work on their SRL, as such, feedback indicating discrepancy could affect students' self-regulation of effort. Another mechanism concerns the evaluation of performance strategies. Feedback can be used to evaluate whether a strategy worked or did not work when working toward the goal. Goal

setting in itself does not include this evaluative information. Therefore, feedback could help inform the effectiveness of strategies and influence selection of subsequent strategies.

Setting goals based on feedback is not merely a reflexive reaction to discrepancies in achieving goals. Rather, it is influenced by various factors such as context, individual attributions and emotions which collectively determine how individuals will react to feedback (Ashford & Stobbeleir, 2013). A study by Iles and Judge (2005) showed that feedback, when positive, has the ability to stimulate individuals to establish new goals for their performance. Students tended to lower their goals after receiving negative feedback and raise them after receiving positive feedback. Moreover, students reported experiencing heightened positive emotions following positive feedback, which subsequently let to upward goal revision.

Additionally, Ashford and Stobbeleir (2013) claim that a combination of feedback and personal improvement goals lead to an improvement in performance. This is particularly true when students set goals for themselves based on the feedback they have received. By setting these personal goals, students are able to focus on specific areas for improvement and work towards achieving their goals. Additionally, a study by Chou and Zou (2020) showed that some students require additional support in order to effectively regulate SRL processes. Chou and Zou, used a computer assisted learning system to provide students with SRL tools such as listening to teachers' lecture, setting goals, a follow-up on their learning and self-assessment. In the goal setting phase, students established their desired performance levels to be covered in the subsequent class as their target goals. Students received feedback from the online learning materials, these tools and feedback aided students in setting target goals for further learning. The aforementioned studies together suggest feedback directed at one's goals (i.e., goal-directed feedback) can enhance the goal setting processes.

While it is clear that feedback can have an impact on goal setting, the type of feedback and who to provide the feedback need further investigation (Wisniewski et al., 2020). Shute (2008) argued that effective feedback should encourage students to formulate their tacit knowledge (motives, ideas, opinions, beliefs) through discussion, reflection, and

experience (Clark, 2012). Through this approach, students will be more likely to perceive feedback as constructive and empowering rather than critical and controlling. When the student experiences feedback as critical or negative, it will hamper their learning (Neubert, 1998; Shute, 2008). Therefore, feedback should be directed at students' task performance and progress rather and a dialogue should take place to understand the feedback (De Kleijn, 2021).

One way to provide students with said feedback is by means of peer feedback where students can have a discussion and reflect on themselves(Clark, 2012; Shute, 2008). A study by Huisman et al. (2019) highlights the beneficial impact of peer feedback on students' performance. Engaging in the process of providing feedback to peers fosters active participation, encourages self-comparison of their own work with others and prompts reflection on ways to enhance their own abilities. However, there were only sixteen studies that investigated student-to-student (i.e., peer) feedback (Wiliam, 2023), as such, more studies are needed to gain insights into the effectiveness of peer feedback.

Goal-directed (Peer) Feedback

Goal-directed feedback provides students with knowledge on the progress towards a desired goal or a set of goals rather than offering feedback on individual responses such as individual tasks (Shute, 2008). Goal-directed feedback can therefore be a helpful tool to support SRL in a number of ways; 1) it can help students to understand their progress toward their specific goal, 2) it can provide specific and actionable suggestions on what to improve or what adjustments to make to achieve the goal more effectively, 3) it can help students to adjust their learning strategies or seek support when needed (Shute, 2008). Providing goal-directed feedback in an academic setting can be challenging given the diverse goals that students might have (Nicol & Macfarlane-Dick, 2006).

Goal-directed peer feedback is beneficial for goal setting because it provides students with an external perspective of their own progress and performance (Nicol & Macfarlane-Dick, 2006). When peers offer feedback on specific goals, it allows students to gain insights into their strengths and areas for improvement. Additionally, goal-directed peer

feedback fosters accountability and motivation as students will set higher goals after achieving their goals (Shute, 2008).

According to Andrade and Heritage (2017), learning is a social process and is co-regulated by peers. Emerging research suggest that peers can play a role in providing feedback to enhance learning (Wisniewski et al., 2020). Overall, goal-directed peer feedback enhances the effectiveness of goal setting by offering valuable input, promoting self-reflection, and facilitating continuous improvement (Shute, 2008). However, very few research has examined whether goal-directed feedback provided from student-to-student (i.e., goal-directed peer feedback) influence students goal setting process. As such more research is needed to explore the effects of goal-directed peer feedback on goal setting.

Current Study

Given the importance of SRL in vocational education and the need to enhance goal setting, this study aims to investigate if goal-directed peer feedback can improve vocational education students' SRL skills regarding goal setting. We formulated the following research question: Does goal-directed peer feedback improve students' goal setting process? We operationalized goal setting process in three ways: goal setting skills, goal content, and goal attainment. We derived three specific hypotheses to answer our research question.

The first hypothesis focuses on goal setting skills. Feedback plays a crucial role in assessing the effectiveness of strategies employed to achieve a goal (Neubert, 1998). Furthermore, feedback serves as a valuable tool for informing students about the effectiveness of their strategies and subsequently influences their decision-making process. Given that goal setting based on feedback goes beyond a simple automatic response as it is shaped by the context it is given in, individual attributions and emotions. These factors collectively influence how students will respond to feedback (Ashford & Stobbeleir, 2013).

H[1]: Students who received the goal directed peer feedback will report a larger increment in their level of goal setting skills after the intervention compared to students who did not receive the goal-directed peer feedback.

The second hypothesis focuses on goal content. Setting realistic and achievable goals support students' self-regulatory responses when working toward the goals (Shute, 2008).

H[2]: Students who received the goal directed peer feedback will formulate goals with better content in terms of specificity, measurable, achievable, realistic and time bound compared to student who did not receive goal-directed peer feedback.

The third hypothesis on goal attainment refers to the process of students achieving their goal. Directing students' attention towards goals through feedback results in greater achievement compared to praising their ability or intelligence (Nicol & Macfarlane-Dick, 2006). This might be difficult in the first week, but it is expected that when students set realistic and feasible goals, they will improve on attaining their goals (Jossberger et al., 2010).

H3: Goal attainment of students who received goal-directed peer feedback will show more improvement over time in comparison with students who did not receive goal-directed feedback.

Methods

Participants

We collected data from five classes of students who enrolled in a Software Development program at a vocational education school in the Netherlands. Furthermore, the students did not receive any compensation or reward for their involvement in this research. We used convenient sampling to distribute students across the two conditions, considering the simultaneous class schedules in the same classroom for two classes and a separate classroom for another class. Therefore, we appointed three classes to the experimental condition and two classes to the control condition. However, due to attrition within the four weeks, the control condition consisted of $n = 15$ students and experimental condition existed of $n = 13$ students (Table 1). A larger group of students $n = 32$ participated in the experimental condition and $n = 18$ for the control condition. They completed the questionnaires over a period of three weeks instead of the initially planned four weeks.

We conducted an a priori power analysis by using G*Power to determine the likelihood that the results of this study are reliable for a mixed-design ANOVA. To achieve a power of 0.80 with an α = .05 and effect size of d = .55 (Neubert, 1998), a total minimum sample size of 63 students was essential to conduct this study, however, due to the attrition rate in the experiment across weeks, we did not meet the sample size of 63 students.

Table 1

Number of Students per Week During Data Collection

	Week 1	Week 2	Week 3	Week 4
Control	35	25	18	16
Experimental	29	28	32	18
Total n	64	53	50	34

Study Context

Data collection happened at a vocational education program where students learn to become Software Developers. This study program scheduled eight project hours a week for students to work on their profession. During these project hours students work on a project individually, in pairs or in teams of four to five people. Students need to plan efficiently and set their own goals when it comes to the project they are working on. Therefore, conducting this study was appropriate in this setting to investigate whether students' goal setting process improves when there is goal-directed peer feedback. The study took place during the first four weeks of the term. Given that the program spans across eight weeks, four weeks would help to evaluate whether students are achieving their goals halfway through their project.

Materials and Measurement

Two university students tested the materials used in this study in a pilot. Additionally, a Dutch language teacher, who teaches Dutch to the target group, checked the questionnaire on language and whether it aligned with vocational education students'

language level. After the pilot and review, we adjusted some sentences to match students'
language level.

Goal Setting Skills

We measured goal setting skills with a pre- and post-test using the goal setting
questionnaire from Pichardo et al. (2018). The questionnaire consisted of six items (α =.58)
on a 7-point Likert scale of 1 (strongly disagree) to 7 (strongly agree). We used the mean
score of the six items to compare students' goal setting skills before the intervention and at
the end of the four-week intervention.

Goal Content

To measure goal content, the researcher scored students' SMART goals by using a
SMART goal rubric. This rubric is based on Rubin's (2015) SMART goal setting rubric to
evaluate SMART goals (Appendix A). For each SMART component students received a
score between 1 (poor) and 4 (best) by the researcher. The score of the goal content is the
sum of all five components, ranging from a minimum score of 4 (poor) to a maximum score
of 20 (best). When students revised their goals in week 2, 3 and 4, we scored the revised
goal to compare improvement in goal content within four weeks.

Two researchers scored the goals of 20 students independently and individually to
ensure interrater reliability. After scoring the students' SMART goals, we needed two
calibration sessions to achieve good agreement. After the re-calibration sessions, the
interrater reliability score between the two raters was κ = .802, indicating a good agreement
(McHugh, 2012).

Goal Attainment

To measure goal attainment, students rated to what extent they perceived to have
achieved the goals set on a 7-point Likert scale of 1 (strongly disagree) to 7 (strongly agree).
We used the mean score of students' goal attainment to compare whether their goal
attainment increased within four weeks.

Goal-Directed Peer Feedback Questions

Students provided each other with goal-directed peer feedback by means of questions (Lawlor & Hornyak, 2012) on the personal goals that they set for themselves. Students who gave feedback received the questions on the five SMART items in Qualtrics (Appendix A). These questions served as a guidance to let students actively think about how they formulated their goals; on the one hand the students used the questions to form a conversation with their peers and on the other hand, students were able to think critically about their goals as the questions provided guidance. Students then had the opportunity to revise their goals if they wished to do so, if they did not want to revise their goals, they could hand in their goals as it was.

Procedure

The secretary of the study program sent the information letter to students and parents two weeks prior to data collection. The researcher explained the study's objective and procedure in the first week. Students received a Qualtrics link, and they provided their informed consent and student ID. It was essential to use students' student ID to track their answers as we linked the Qualtrics survey tool with their student IDs to make sure that students would see their set goals the next week. After providing their informed consent, students proceeded with the Goal Setting questionnaire (pre-test) and had to set a goal that they wanted to achieve during their project hours (*Beroeps)*.

At the start of the first class in the second week, the researcher gave instructions to the experimental condition (goal-directed peer feedback) on how to use the goal-directed peer feedback form to give feedback according to the five components: **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**imely. After instructions, we assigned students to work in pairs where student A provided student B with feedback and vice versa by using the SMART goals worksheet in Qualtrics. After every question the students ticked off a box to confirm they did have a conversation about the set goals. After peer feedback students had the choice to revise their goals if necessary and answered the goal attainment question.

Students in the control condition received the same instructions as the experimental condition, however they did not give each other feedback on the goals they set for themselves. The researcher repeated this procedure in week three and week four. Additionally, in the final week, both groups filled the Goal Setting questionnaire (post-test). After data collection the researcher replaced student numbers in the raw-file spreadsheet with random numbers to ensure anonymity. The researcher did this by using a formula in the spreadsheet.

Data Analysis

We excluded any data from students who did not fully partake for at least three weeks. After cleaning the data, the first step in the data analysis was to check the assumptions. Before data analysis, the researcher checked whether we met the assumptions for a mixed-design ANOVA; (1) data is of interval level (2) independent variable consists out of two categorical groups (Control and Experimental Condition (3) observations were independent, and (4) there are no significant outliers. We will only report the steps to reconcile any violations if we do not meet the assumptions.

We used a mixed-design ANOVA for the control and experimental condition to measure improvement in students' goal setting skills with a pre- and post-test (two time points), goal content (at four time points) and goal attainment (three time points).

<div align="center">Results</div>

Goal Setting Skills

Table 2 shows the means and standard deviations for students who completed both pre- and post-test on goal setting skills in the control condition and experimental condition.

Table 2

Means and Standard Deviations of Pre- and Post-test in Control and Experimental Condition
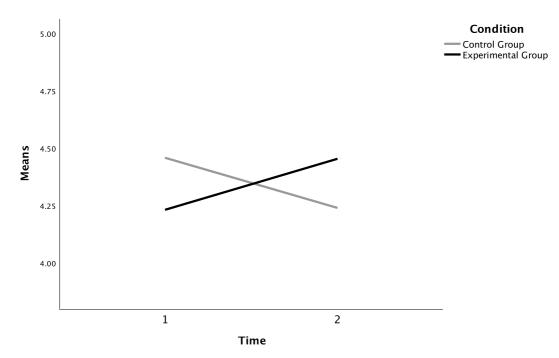
		Pre-test			Post-test	
	n	M	SD		M	SD
Control Condition	16	4.46	.83		4.24	.65
Experimental Condition	18	4.23	.71		4.45	.70

Results of the mixed-design ANOVA showed that there was a non-significant main effect of condition on goal setting skills, $F(1, 32) = 0.00$, $p < .988$, $\eta^2 = .00$. Furthermore, there was a non-significant difference measured for the goal setting skills between the experimental and control condition, $F(1, 32) = 0.01$, $p < .977$, $\eta^2 = .00$. There was also no interaction effect of condition and time on goal setting skills, $F(1, 32) = 3.83$, $p < .06$, $\eta^2 = .11$.

However, goal setting skills for the experimental condition shows a slight increase in means (Figure 2). Indicating that even though there is a non-significant improvement, the experimental condition shows a small improvement in comparison with the control condition.

Figure 2

Means for Time and Condition on Pre- and Post-test

Goal content

Table 3 shows the descriptive statistics with the means and standard deviation for the control and experimental condition for four time points.

Table 3

Descriptive Statistics of Goal Content (SMART) for the Control- and Experimental Condition

	n	SMART1		SMART2		SMART3		SMART4	
		M	SD	M	SD	M	SD	M	SD

Control Condition	15	7.13	.64	7.07	.59	6.87	.35	7.07	.59
Experimental Condition	13	6.62	1.94	6.69	2.06	6.85	1.99	7.31	2.21

There was a violation of the homoscedasticity of variances assumption, Mauchly's test W = .112, p = <.001. The Greenhouse-Geisser (ε = .522) nor Huyn-Feldt correction (ε = .571) could be used to correct this violation as the values were below ε = .75 (Field, 2018, p.671), therefore, we conducted a MANOVA (Field, p.671).

Results of the MANOVA show that there was a non-significant effect of goal-directed peer feedback on goal content, F (1, 26) = .96, p <.337, $\eta2$ = .04. These results indicate that students in the experimental condition did not show improvement in goal content compared to students in the control condition.

Exploratory Analysis on Goal Content

As the sample size for three time points (*n = 50)* was more than four time points (*n = 28),* we conducted an exploratory analysis based on the larger sample size to further investigate the effect of goal-directed peer feedback on goal content. Table 4 shows the means and standard deviation for both conditions for three time points.

Table 4

Means and Standard Deviation of Goal Content (SMART) for the Control and Experimental Condition

		SMART1		SMART2		SMART3	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control Condition	18	7.17	.62	7.11	.58	6.94	.42
Experimental Condition	32	6.66	1.62	6.84	1.78	7.56	2.82

There was a violation of the homoscedasticity of variances assumption, Mauchly's test W = .573, p = <.001. The Greenhouse-Geisser correction (ε = .701) nor the Huyn-Feldt correction (ε = .731) could be used because results were lower than the threshold of ε = .75 (Field, 2018, p.671), therefore we conducted a one-way MANOVA (Field, p.671).

Results of the MANOVA show that there was a non-significant effect of goal-directed peer feedback on goal content, $F(1, 48) = .1.64$, $p < .206$, $\eta 2 = .03$. These results indicate that students in the experimental condition did not show an improvement in goal content compared to students in the control condition within three time points.

Goal Attainment

Table 5 shows the descriptive statistics with the means and standard deviation for both conditions for three time points.

Table 5

Descriptive Statistics of Goal Attainment for Control Condition and Experimental Condition

	n	GOALAT1		GOALAT2		GOALAT3	
		M	*SD*	*M*	*SD*	*M*	*SD*
Control Condition	16	4.88	*1.78*	5.31	*1.19*	4.94	*1.88*
Experimental Condition	14	5.00	*1.17*	4.79	*1.72*	4.43	*1.65*

Results show that there was a non-significant difference of time on goal attainment $F(2, 56) = 1.14$, $p < .590$, $\eta^2 = .02$. Nor was there a significant difference of goal attainment between the control condition and experimental condition at four time points $F(1, 28) = .51$, $p < .482$, $\eta^2 = .02$. There was a non-significant interaction of condition and goal attainment $F(2, 56) = .58$, $p < .565$, $\eta^2 = .02$. These results indicate that students in the experimental condition do not show improvement in attaining goals compared to the control condition.

Discussion

In this experiment, we examined whether goal-directed peer feedback enhances students' goal setting skills in a four-week intervention. We formulated three hypotheses to investigate the effect of goal-directed peer feedback on setting goals in terms of goal setting skills, goal content and goal attainment. The intervention consisted of students giving each other goal-directed peer feedback by means of SMART-goal worksheet which consisted of questions based on the SMART-goal components. We failed to confirm our three

hypotheses based on the mixed-design ANOVA, as we did not find any improvement in goal setting skills, goal content or goal attainment across the two conditions.

The first hypothesis posited that students who receive goal-directed peer feedback would show improvement in their goal setting skills after intervention compared to students who do not receive such feedback. However, contrary to our expectations, results of the first hypothesis are not aligned with the findings of previous studies that suggest feedback has a positive impact on goal setting (Hattie & Timperley, 2017; Neubert, 1998). Although the experimental group did exhibit a slight increase in means, indicating a potential improvement in students' goal setting skills. This is in line with previous studies that do show that that goal-directed peer feedback improves students' goal setting skills (Chou & Zou, 2020; Ilies & Judge, 2005). However, this finding was not supported by the data analysis as often happens with most feedback studies due to heterogeneity (Wiliam, 2023) and thus, we cannot draw a firm conclusion.

For the second hypothesis, we explored the effect of goal-directed peer feedback on goal content. We examined whether goal-directed peer feedback would lead to better formulated goals in terms of specificity, measurable, achievable, realistic and time bound compared to students who did not receive goal-directed peer feedback. Whereas previous research has emphasized the importance of setting realistic and achievable goals to support students' self-regulatory response (Shute, 2008) results of this study showed that students' goal content did not improve. As was the case for three time points as well as the four time points. Taking the findings of the data analysis into consideration; findings show that goal-directed peer feedback did not improve students setting more effective and well-defined goals as opposed to what we expected. While previous studies (Clark, 2012; Huisman et al., 2019) show that having a dialogue about feedback improves the goals set, this was not the case in our study.

The third hypothesis centered around goal attainment, focusing on the students' ability to achieve their set goals. We expected that students who set realistic and feasible goals would show improvement in attaining their goals (Jossberger et al., 2010). The

findings, however, provide no support for this hypothesis. Feedback received from peers did not positively improvement students' ability to effectively work towards achieving their goals. The findings provide no evidence of goal-directed peer feedback enhancing students' goal setting skills.

Limitations

Conducting quasi-experimental quantitative research over a span of four weeks can be rather challenging given that students might lose motivation or forget the learning objective. Therefore, several limitations should be acknowledged in this study. Firstly, expertise in giving peer feedback. We observed that students did not allocate sufficient time to provide feedback to one another, despite the well-thought-out plan for peer feedback and the clear instructions for students. We also observed that some students had difficulty formulating their goals, however, the researcher refrained from intervening to prevent confirmation bias (Morling, 2020). As such, the students had to figure out how to correctly set goals for themselves as the questions to help them did not provide enough support. Previous research by Shute (2008) and De Kleijn (2021) show that in order for feedback to be effective, students should have support in understanding and interpreting feedback to close the gap between their current state and desired state. Additionally, Chappuis (2012) also argues that students need a structured environment and feedback culture to effectively give and receive peer feedback. Even though we did not find any significant results in this study, further research is warranted to explore the long-term effects of goal-directed peer feedback on students' goal setting skills as well as investigate potential variations across different educational contexts and student populations.

Furthermore, future research could also explore the effectiveness of creating a peer feedback culture within classrooms by providing not only students but also teachers with the necessary tools and knowledge to help their students learn how to provide feedback to enhance their SRL skills (Chappuis, 2012; De Kleijn, 2021). Chappuis claims that it is essential for students to not only receive feedback but also know how to utilize and act upon it for it to be truly useful. Furthermore, Carless and Boud (2018) stipulate that to enhance

feedback processes, students require both an understanding of how feedback can be effective and ample opportunities to apply feedback and to uptake feedback to enhance their SRL.

The second limitation is that this study did not provide students with specific learning objectives which Chappuis (2012) and Shute (2008) claim are crucial for effective feedback. Feedback is most valuable when it is aligned with intended learning outcomes when provided specific guidance for improvement (Shute, 2008). Even though students were able to set personal goals regarding their own project, the learning objective might not have been clear enough for students to maximize their learning and need for improvement (Nicol & Macfarlane-Dick, 2006). Offering teachers clear instruction on how to incorporate goal-directed peer feedback consistently and systematically across their curriculum could be beneficial in future research. Alternatively, other feedback methods, such as individualized feedback or a goal-setting training program could be explored to enhance students' goal setting skills and feedback literacy (De Kleijn, 2021).

The third limitation is goal setting as how students set goals may have posed a limitation in this study. Some students did not set sufficient goals while other set ambitious goals. this suggests that students require more support in setting meaningful and achievable goals (Ashford & Stobbeleir, 2013). Carless and Boud (2018) identified teachers as an important factor in facilitating and promoting students' understanding of feedback by using exemplars and discussions with their students to enhance their SRL strategies. Chappuis (2012) emphasizes the importance of three conditions before offering feedback: students should have a clear vision of intended learning, feedback instruction should be explicit, and students should be able to assess their own progress. Therefore, future investigation into how students can set more meaningful and achievable goals, using approaches beyond SMART goals such as PDCA-cycle, Scrum & Agile, or regular process tracking, with teacher support might yield valuable insights.

Conclusion

Supporting students in how to self-regulate their learning is important to prepare them for their future profession. The support that students need to actively work on their SRL skills and setting meaningful and realistic goals adds a complex layer to investigating the effect of goal-directed peer feedback on goal setting. Previous studies showed that feedback improves students' goal setting skills. However, based on the results of this study, it can be concluded that goal-directed peer feedback did not have a significant impact on students' goal setting skills, goal content or goal attainment. Furthermore, while a small increase in means did show that goal-directed peer feedback improved the quality of formulating goals, the underlying reason for this finding remains unclear. Additionally, feedback instruction and practice, as well as a highly structured setting, is needed for students to effectively give and receive feedback. Therefore, the need for further research to explore the potential benefits of goal-directed peer feedback on goal setting processes and outcomes is needed. Other instructional strategies regarding goal setting may need to be considered to effectively enhance students' goal-setting abilities so that they can work on their SRL skills.

References

Andrade, H.L., & Heritage, M. (2017). *Using Formative Assessment to Enhance Learning, Achievement, and Academic Self-Regulation.* Routledge.

Ashford, S. J., & De Stobbeleir, K. E. (2013). Feedback, goal setting, and task performance revisited. In *New Developments in Goal Setting and Task Performance* (pp. 51-64). Routledge.

Butler, D. L., & Winne, P. H. (1995) Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research,* 65(*3)*, 245-281. https://doi-org.proxy.library.uu.nl/10.3102/00346543065003245

Carless, D., & Boud, D. (2018). The development of student feedback literacy: enabling uptake of feedback. *Assessment and Evaluation in Higher Education,* 43(*8*), 1315-1325. https://doi.org/10.1080/02602938.2015.1463354

Chappuis, J. (2012, September). Leadership for learning. How am I doing? *Educational Leadership,* 70(*1)*, 36-41.

Chou, C.Y., & Zou, N.B. (2020). An analysis of internal and external feedback in self-regulated learning activities mediated by self-regulated learning tools and open learner models. *International Journal of Educational Technology in Higher Education, 17*(1). https://doi.org/10.1186/s41239-020-00233-y

Clark, I. (2012). Formative Assessment: Assessment Is for Self-regulated Learning. *Educational Psychology Review*, *24*(2), 205-249. https://doi.org/10.1007/s10648-011-9191-6

De Kleijn, R.A. (2021). Supporting student and teacher feedback literacy: An instructional model for student feedback processes. *Assessment & Evaluation in Higher Education, 48*(2), 186-200. https://doi.org/10.1080/02602938.2021.1967283

Field, A. (2018) *Discovering Statistics Using IBM SPSS Statistics.* SAGE Publications Limited.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. https://doi.org/10.3102/003465430298487

Ilies, R., & Judge, T. A. (2005). Goal regulation across time: The effects of feedback and affect. *Journal of Applied Psychology,* 90(3), 453-467.

Jossberger, H., Brand-Gruwel, S., Boshuizen, H., & van de Wiel, M. (2010). The challenge of self-directed and self-regulated learning in vocational education: A theoretical analysis and synthesis of requirements. *Journal of Vocational Education & Training, 62*(4), 415-440. https://doi.org./10.1080/1363820.2010.523479

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.

Lawlor, K.B., & Hornyak, M.J. (2012). Smart goals: How the application of smart goals can contribute to achievement of student learning outcomes. *Development in Business Simulation and Experiential Learning,* 39, 259-260.

Morling, B. (2020) *Research Methods in Psychology – Evaluating a World of Information.*

McHugh, M.L. (2012, October 1). *Interrater reliability: the kappa statistic.* PubMed Central (PMC). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3900052/

Mejeh, M., & Held, T. (2022). Understanding the development of self-regulated learning: An intervention study to promote self-regulated learning in vocational schools. *Vocations and Learning, 15*(3), 531-568. https://doi.org/10.1007/s12186-022-09298-4

Morling, B. (2020). *Research Methods in Psychology – Evaluating a World of Information*. W. W. Norton.

Neubert, M. J. (1998). The value of feedback and goal setting over goal setting alone and potential moderators of this effect: A meta-analysis. *Human Performance*, *11*(4), 321-335.

Onderzoek en informatie, SBB (n.d.). https://s-bb.nl/activiteiten/onderzoek-en-informatie/

Pichardo, M. C., Cano, F., Garzón-Umerenkova, A., de la Fuente, J., Peralta-Sánchez, F. J.,

    & Amate-Romera, J. (2018). Self-Regulation Questionnaire (SRQ) in Spanish

    Adolescents: Factor Structure and Rasch Analysis. *Frontiers in Psychology*, *9*.

    https://doi.org/10.3389/fpsyg.2018.01370

Rubin, J. (2015). Using goal setting and task analysis to enhance task-based language

    learning and teaching. *Dimension*, 70-82.

Shute, V.J., (2008) Focus on formative feedback. *Review of Educational Research 78*(1),

    153-189. https://doi.org/10.3102/0034654307313795

Wiliam, D. (2023). Putting learners at the heart of the feedback process: Reflections on the

    special issue. *Learning and Instruction, 87*, 101785.

    https:doi.org/10.1016/jlearnininstruc.2023.101785

Wisniewski, B., Zierer, K., & Hattie, J. (2020). The power of feedback revisited: A meta-

    analysis of educational feedback research. *Frontiers in Psychology, 10.*

    https://doi.org./10.3389/fpsyg.2019.03087

Zimmerman, B., & Schunk, D. H. (2011). *Handbook of Self-Regulation of Learning and*

    Performance (Educational Psychology Handbook) (1st ed.). Routledge.

    https://doi.org/10.4324/9780203839010

Appendix A: SMART-Goals Feedback Formulier

Datum gesprek: _____

Gesprek met (vul studentnummer in): _____

Doel student: _____

Gebruik dit formulier om een gesprek te voeren met je peer, en check of het gestelde doel

   SMART is:

1. **Specifiek**: Wat is je doel? Wat wil je bereiken? Waar ga je dit doen? Waarom wil je

   dit bereiken?

   Feedback gegeven op dit element? Zet een kruis in het vakje als je dit hebt afgerond. ☐

2. **Meetbaar**: Hoe weet je wanneer je doel bereikt is? Hoeveel moet je doen om dit doel

   te behalen? Wat is het eindresultaat?

   Feedback gegeven op dit element? Zet een kruis in het vakje als je dit hebt afgerond. ☐

3. **Acceptabel**: Is het bereiken van je doel realistisch binnen jouw eigen kunnen? Heb

   je genoeg middelen om je doelen te bereiken? Als dit niet zo is, hoe ga je dan je doel

   bereiken?

   Feedback gegeven op dit element? Zet een kruis in het vakje als je dit hebt afgerond. ☐

4. **Realistisch**: Waarom is dit doel belangrijk om te halen? Is je doel makkelijk of

   moeilijk om te behalen?

   Feedback gegeven op dit element? Zet een kruis in het vakje als je dit hebt afgerond. ☐

5. **Tijdsgebonden:** Wanneer moet je doel bereikt zijn? Wanneer ben je klaar met je

   doel en wanneer heb jij je doel gehaald?

   Feedback gegeven op dit element? Zet een kruis in het vakje als je dit hebt afgerond. ☐

   Lever dit formulier in bij de onderzoeker als je klaar bent, vergeet je niet het

   studentnummer op te schrijven? Dankjewel!

Appendix A - Goal Setting Questionnaire and SMART Goal Rubric

Vragenlijst Doelstellingen

Item	Statement	1	2	3	4	5	6	7
1	Ik hou meestal mijn voortgang bij ten opzichte van mijn doelen	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens
2	Ik heb moeite met het stellen van doelen voor mijzelf	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens
3	Ik heb moeite met het maken van planningen om mijn doelen te bereiken	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens
4	Ik stel doelen voor mijzelf en houd mijn voortgang bij	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens
5	Als ik een doel heb kan ik meestal een plan maken om het te bereiken	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens
6	Als ik het voornemen heb om iets te veranderen let ik goed op hoe het gaat	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens

Vragenlijst Halen van Doelen

In hoeverre ben je het eens met de volgende stelling:

Item	Statement	1	2	3	4	5	6	7
1	Ik heb mijn gestelde doelen gehaald voor deze week	Sterk oneens	Oneens	Enigszins oneens	Neutraal	Enigszins eens	Eens	Sterk eens

Ik heb mijn doelen bijgesteld: Ja/Nee

Smart Goal Rubric for Scoring

Criteria	Best (4)	3	2	(Poor) 1
Specific	The goal is very specific.	The goal is not very specific or there are several goals.	The goal is vague or not clear.	The goal is not a goal, or no goal is given.
Measurable	Clear and explicit criteria for measurement are stated.	Criteria are not very clear or very explicit.	Criteria given are hard to apply.	No measure of stated goal is given.
Achievable	The learner provides specific evidence why the goal is achievable citing their own knowledge and time constraints.	The learner identifies steps to reach goal but only mentions time or knowledge why it is achievable.	The learner identifies steps to reach goal but does not mention their own knowledge or time constraints.	No answer is given.
Relevant	The learner provides de- tailed reasons why the goal is relevant to his/ her interests.	The learner provides sparse evidence why the goal is relevant and personal.	The learner says the goal is relevant but provides no evidence that the goal is relevant.	There is no indication No answer is given.
Time-based	The learner states a clear and realistic time for accomplishing the goal. It is realistic given the knowledge a learner has.	The learner gives a specific time for accomplishing the goal, but it doesn't seem realistic.	The stated time is vague or unrealistic given the stated goal.	No time for accomplishing the goal is stated