Chapter 10

Relevant Conditions for Teachers' Use of Student Feedback

Sebastian Röhl and Holger Gärtner

Abstract Based on the findings from research on organizational feedback and data use in schools, this chapter systematizes relevant factors influencing the use of student feedback by teachers in three domains: (1) personal characteristics of feedback recipients (teachers), (2) characteristics of the organization (school), and (3) characteristics of feedback information (data). We identified teachers' self-efficacy, attribution styles, goal orientations, and age or professional experience as relevant individual characteristics. In addition, teachers' attitude toward students' trustworthiness or competence as a feedback provider appeared to be relevant for the use of student feedback. Beyond that, findings on organizational characteristics for teachers' successful dealing with feedback pointed to the importance of a feedback culture and organizational safety, leadership, supportive measures, and perceived function of feedback as control vs. development. Furthermore, relevant characteristics of feedback information were identified as comprehensibility, valence, and specificity. Although such findings from other fields of research have been known for some time, studies on student feedback concerning these aspects are rare. Finally, practical measures are derived for each of the three domains in order to increase the use of student feedbacks by teachers.

Keywords Student feedback · Teacher characteristics · Organizational characteristics · Feedback information · Data use

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1 Introduction

Since the publication of Hattie's meta-analysis *Visible Learning* (2009), the use of student feedback as an effective method for improving the quality of teaching has moved strongly into the focus of educational practice (see Chap. 8 by Wisniewski and Zierer in this volume). Besides that, student feedback is also discussed in models of data-based decision-making, and is seen as an informative addition to the analysis of student performance data in order to provide teachers with well-founded information about areas in their teaching which they can improve (Lai & Schildkamp, 2013). The use of student feedback consists of two different phases: First, teachers ask their students for feedback on teaching and their perception of the learning environment. In a second step, this information can be used to develop teaching and professional competencies. This chapter focuses on the questions of (a) which factors have an influence on whether teachers collect feedback on their teaching and (b) whether they use this feedback to improve their teaching. To answer these questions, we examine two different research approaches. In one approach, the results of student surveys can be understood as feedback on teaching, so that theories and findings from the field of organizational feedback research can provide important information (e.g., London & Smither, 2002; Smither et al., 2005a). In the other approach, the results of student surveys can be seen as relevant data about teaching quality. In this case, theories and findings from the field of data-based decision-making in schools (e.g., Schildkamp, 2019; Schildkamp et al., 2015) are helpful in providing relevant information on this topic.

The research on feedback in organizational psychology focuses more on cognitive, emotional, and motivational processes of the feedback receiver, which can subsequently lead to behavioral changes, such as improved performance and increased commitment. From this point of view, it is necessary that the receiver accepts the feedback, desires to respond, develops and aims for alternative actions, and finally implements these (Ilgen et al., 1979; Smither et al., 2005a; Kahmann & Mulder, 2011; Introduction to this volume by Röhl et al.). For this process, the characteristics of (1) the feedback recipient, (2) the sender and his or her relation to the recipient, (3) the feedback message, and (4) the organization have proven to be important factors.

Models of data-based decision-making describe the process of using data to support school quality development (e.g., Brunner & Light, 2008; Helmke & Hosenfeld, 2005). Lai and Schildkamp (2013) define the process as consisting of five steps: (1) First of all, it is necessary to clarify within the school which question the data should answer, i.e. the purpose of the data collection. (2) Subsequently, the data considered as relevant are collected (e.g., performance data, classroom observations, survey data, school administration data, etc.). (3) The data collected are analyzed with regard to the initial question. This is followed by (4) an interpretation in terms of meaning for the initial question and the consequences they should have for school and teaching development. (5) The last step is an implementation of the planned measures in everyday school life. Based on well-known models of data-based school and teaching development, relevant influencing factors on the process of data use

can be distinguished at different levels (Coburn & Turner, 2012; Visscher & Coe, 2003). Schildkamp et al. (2017), for example, differentiate between three relevant influencing factors on the process of data use: (1) characteristics of the school organization, such as the existence of support structures or the significance of data use for school management, (2) characteristics of the existing data, such as user-friendliness or timely provision, and (3) characteristics of data users, such as how qualified teachers are in analyzing data or what attitudes they have towards the use of data.

In addition, however, a differentiation should be made as to whether the collection of student feedback is voluntary or not, and for what purpose the feedback should be used. The following situations can be distinguished: (a) teachers voluntarily searching for feedback on their own initiative, (b) student feedback is delivered to teachers as established practice or given by the organization, but without official accountability purpose, and (c) student feedback with accountability purposes. Most of the literature included in this overview refers to situations (a) and (b).

2 What Are Relevant Conditions for Teachers' Use of Student Feedback?

This chapter summarizes the empirical findings from literature on relevant influencing factors according to the three areas mentioned in both research fields (teachers as feedback recipients and data users, school organization, and feedback message or data). As the feedback senders in this context are uniformly students, teachers' perception of the students as competent in this point is particularly relevant.

2.1 Teachers as Feedback Recipients And Data Users: Relevant Individual Characteristics

Studies on feedback use from organizational research usually focus on one or more of the following aspects: feedback-seeking behavior, acceptance, perceived usefulness, and performance improvement due to feedback.

Older employees or those with a longer professional experience perceive feedback as less useful (Ilgen et al., 1979). This tendency is also evident for teachers: older teachers seek less feedback from colleagues or peers (Kunst et al., 2018; Runhaar et al., 2010). Regarding student feedback, teachers with longer professional experience are more skeptical of the usefulness (Dretzke et al., 2015) and older teachers use student feedback less often (Ditton & Arnold, 2004b). Some findings on *gender* effects regarding feedback show that female teachers seek more feedback from colleagues (Runhaar et al., 2010) and tend to improve their teaching more after a student feedback intervention (Buurman et al., 2018).

Many findings from social cognitive psychology showed *self-efficacy* to be a particularly important personal factor in the use of feedback (e.g., Bandura, 1997; Heslin & Latham, 2004; Lyden et al., 2002; Sedikides & Strube, 1995; Stajkovic & Sommer, 2000). This seems obvious, as receivers of critical or negative feedback are more likely to respond with additional effort if the person is convinced of achieving an improvement. In addition, feedback is seen as less threatening to self-esteem if persons are convinced that they could respond productively to criticism. In this way, teachers with a higher self-efficacy seek more feedback and are more willing to reflect upon it (Runhaar et al., 2010). A higher self-efficacy correlates with a positive attitude toward school evaluation results (Schneewind, 2007). Ditton and Arnold (2004b) find a differential effect of teachers' self-efficacy on the improvement of teaching after a student feedback intervention.

Closely related to self-efficacy is the concept of *attribution styles* (Weiner, 1985). People differ in whether they attribute the causes of a performance result or feedback more to themselves (internally) or to other people and circumstances (externally). Additionally, the causes can be seen as stable or variable. Persons further differentiate whether these causes are controllable or not. Since attribution styles are particularly associated with motivational and emotional effects as well as convictions regarding individual freedom for action and options, they are considered relevant for dealing with feedback (Strijbos & Müller, 2014). For example, a change in effort or action which is based on negative or corrective feedback can only take place if the recipient assesses the feedback cause as changeable by him- or herself—this corresponds to an attribution as internal, variable, and controllable. With an internal attribution, the receiver can assume responsibility for his or her own results. If, in addition, the cause of a negative result is regarded as controllable and changeable, adjustment processes can be initiated to achieve the performance target. If the cause of negative feedback is considered to be internal, but stable and not controllable, e.g., attributed to one's own lack of ability, this will not lead to a motivation for change. Furthermore, an attribution to one's own personality can lead to negative, performance reducing affects (Kluger & DeNisi, 1996) and to a weakening of the self-concept (Ilgen & Davis, 2000). In the same way, positive feedback can only increase self-efficacy if the cause is assessed as controllable and internal (Bandura, 1997; Lyden et al., 2002; Tolli & Schmidt, 2008). In order to maintain a positive self-concept, recipients of negative feedback tend toward an external attribution (Korn et al., 2016; Sedikides & Strube, 1995). Studies in the school context identified teachers' attribution styles as crucial for the sensemaking process in the context of student achievement and self-evaluation data use (Bertrand & Marsh, 2015; Schildkamp & Visscher, 2009). For example, teachers who attributed students' achievement to their own instruction as internal, variable, and controllable improved their teaching successfully, while the causal attribution to student or test characteristics inhibited instructional improvement (Bertrand & Marsh, 2015). Although these effects have been much elaborated in psychological research, as far as we know only Tacke and Hofer (1979) analyzed effects of teachers' ($n = 20$) internal and external attributions of received positive and negative student feedback. Their results could not show any associations regarding teachers' improvement of teaching.

As a further relevant personal factor, various studies show significant effects of persons' *goal orientations* on the processing and use of feedback (Elliott & Dweck, 1988). Most research approaches distinguish between: mastery goal orientation, which focuses on the development of competence or task mastery; performance-approach goal orientation, with a focus on presenting competence relative to others; and performance-avoidance goal orientation, which concentrates on the avoidance of demonstrating incompetence (Elliot, 1999). Performance goal orientations are often linked with the belief that abilities (e.g., intelligence) or competencies are internal, stable, and not controllable. By contrast, people with a high mastery goal orientation tend to assume that their own abilities can be changed or improved, thus tending toward internal, variable, and controllable attribution. Furthermore, studies from organizational psychology point out significant correlations between persons' self-efficacy and mastery goal orientation (Runhaar et al., 2010; VandeWalle, 2001). For the processing and constructive reaction to negative feedback, a high mastery goal orientation proves to be favorable (Elliott & Dweck, 1988; He et al., 2016; Heslin & Latham, 2004), whereas a high performance-avoidance goal orientation often leads to lower performance in this situation (VandeWalle et al., 2001). When feedback is positive, performance-approach goal-oriented persons tend to react with increased effort, whereas mastery goal-oriented individuals retain their performance or show a weaker increase of effort (Cianci et al., 2010; Donovan & Hafsteinsson, 2006).

Studies on teachers' handling of collegial feedback from colleagues or peers also confirm these effects (Funk, 2016; Kunst et al., 2018), whereas teachers with a high mastery and a low performance-avoidance goal orientation showed the highest level of feedback-seeking behavior (Runhaar et al., 2010). Therefore, we assume that motivational goal orientations show similar effects for the teachers' use of student feedback, although the only study we found in this regard (Tacke & Hofer, 1979) did not prove any such effects, albeit using an older conceptualization of general achievement motivation.

Even though goal orientations are largely stable personality traits (Praetorius et al., 2014), they can partly be controlled by prompting effects. If an evaluation or feedback is presented as a learning opportunity, this tends to lead to a higher mastery orientation, whereas the description as a control instrument is associated with a stronger performance-achievement or performance-avoidance goal orientation, depending on whether the person considers him/herself to be competent and capable (Cianci et al., 2010). This could also explain the strong relation of teachers' perceived control purpose of student feedback with their resistance against this instrument and so lower acknowledgment of the feedback (Elstad et al., 2015). Conversely, a perceived developmental purpose of student feedback is linked to a higher appreciation of usefulness (Elstad et al., 2017).

In the context of data-based decision-making, teachers' *data literacy* is mentioned as an important factor for the use of student achievement data (Schildkamp et al., 2017). This means that the teacher must be able to understand the results (data),

which are often numerical, draw the right conclusions, and translate them into action-leading steps for their subsequent teaching (Mandinach & Gummer, 2016). Obviously, teachers must also have a kind of data literacy when using student feedback. However, as far as we know, no study results are available in this regard.

Studies investigating the relationships between the Big 5 *personality traits* and the use of feedback show inconsistent and sometimes contradictory findings (Strijbos & Müller, 2014). Some analyses suggest a positive effect of a higher agreeableness and conscientiousness on the feedback use and acceptance (e.g., Bell & Arthur, 2008; Guo et al., 2017). Other findings show a negative effect of extraversion and neuroticism (Smither et al., 2005b), or indeed failed to find any significant correlation (Walker et al., 2010).

Findings on effects of teachers' *stress* experience indicate a negative association with student feedback use (Ditton & Arnold, 2004b). Simultaneously, another analysis indicates that self-evaluations can lead to additional stress experiences among teachers, which in turn lead to a stronger rejection of the procedure and a lower acceptance of student feedback (Elstad et al., 2015).

As many studies from organizational psychology point out, the perceived trustworthiness and competence or expertise of the feedback provider has an important effect on the acceptance and usage of feedback (Cherasaro et al., 2016; Ilgen et al., 1979; Lechermeier & Fassnacht, 2018; Steelman et al., 2004; Raemdonck & Strijbos, 2013). In the context of student feedback to teachers, this means that teachers' attitudes to student judgment accuracy and trustworthiness have an important impact. Findings of several studies confirm this point (Balch, 2012; Ditton & Arnold, 2004b; Elstad et al., 2017), whereas the analyses of Gärtner (2014) show a positive correlation between skepticism regarding student responses and reported usage of feedback. Especially skepticism about feedback from young students is reflected in studies which focus on the quality of feedback from primary school students (De Jong & Westerhof, 2001). This skepticism may explain the low use of student surveys in primary schools. Gärtner (2010), for example, shows (on the basis of the usage statistics of an online portal for student surveys in the German federal states of Berlin and Brandenburg) that only a few feedback-surveys take place in primary schools (8.3% in grade levels 3 & 4 and 18.7% in grade levels 5 & 6), although about half of all students are taught in primary schools. On the other hand, there is also evidence of the validity of primary school students' perception of teaching (Fauth et al., 2014; Gärtner & Brunner, 2018; van der Scheer et al., 2019). These results prompt the questions: (a) under which circumstances do teachers trust younger students to be able to assess teaching competently? (Iglar et al., 2019); or rather (b) which student characteristics influence whether teachers assess their students as competent feedback providers (age, achievement level, socio-economic status, language skills, etc.)? In addition, studies are still lacking on the adjacent question of the extent to which teachers' student orientation is linked with the acceptance and perceived usefulness of student feedback.

2.2 School: Relevant Organizational Characteristics

Several studies summarize different organizational characteristics, such as support for giving and interpreting feedback, a non-threatening atmosphere, or the value of feedback to improve, as *feedback culture* of an organization. The results provide evidence of the importance of this overall concept as moderator for the use of feedback in organizations (Kahmann, 2009; London & Smither, 2002; Mulder, 2013). Also, for the systematic use of student feedback, feedback culture within teaching staff has been found relevant (Gaertner, 2014). In addition, compliance-oriented cultures in schools appeared to hinder developmental use of students' achievement data (Farrell & Marsh, 2016).

However, studies have also shown that specific organizational characteristics have effects on the productive use of feedback. The perceived *team psychological safety*, which means that team members share a belief that the team is safe for interpersonal risk taking, has proved to be relevant for feedback use (Edmondson, 1999; Harvey et al., 2019; Semmer & Jacobshagen, 2010).

In addition, a beneficial approach to increase the productive use of feedback in organizations is to offer special support in understanding feedback, setting goals, and implementing them in practice; this includes coaching, group reflections, and counseling (Luthans & Peterson, 2003; Smither et al., 2003; Walker et al., 2010). In the context of data use at schools, training and support for teachers with regard to data analysis and interpretation has been found instrumental for instructional data use (Farrell & Marsh, 2016; Kerr et al., 2006; Schildkamp & Visscher, 2009). In the context of student feedback, in particular, those intervention studies which provided supportive measures for reflection and teaching development show significantly higher positive effects (see Chap. 9 by Röhl in this volume).

In all of this, *leadership* plays an important role in feedback usage processes. In organizational research, transformational leadership (Bass, 1985) proved to be advantageous for team learning, feedback processes, and reflection in working groups and school teams (Lam, 2002; Runhaar et al., 2010; Tuytens et al., 2019). According to this concept, school principals should provide a clear vision for the future, inspire teachers, give the work a greater sense of meaning, and stimulate the questioning of old assumptions. Findings from research on data-based decision-making processes in schools pointed to the importance of encouragement from principals (Schildkamp & Visscher, 2009) and teachers' feeling of autonomy to make decisions about their instruction in data use processes in schools (Kerr et al., 2006; Prenger & Schildkamp, 2018). Whether teachers interpret the obtaining of student feedback more as a control or as a development opportunity depends on the communication from the school leaders (Elstad et al., 2017; Lejonberg et al., 2017). Active encouragement by school leaders of teachers to seek student feedback is also supportive, as extrinsically motivated feedback use is just as beneficial to reported improvements in teaching as is intrinsically motivated feedback use (Gaertner, 2014).

2.3 Feedback Message as Data: Relevant Feedback Characteristics

As several studies reveal, also the characteristics of the feedback message show relevant effects on the processing and use of feedback (Coe, 1998; Ilgen et al., 1979; Kluger & DeNisi, 1996). In this way, the comprehensibility of feedback results proves to be an important predictor for feedback use both in school performance studies (Groß Ophoff, 2013) and in the context of student feedback (Ditton & Arnold, 2004a; Rösch, 2017). The findings of a study by Merk et al. (2019) on online-based student feedback indicate that teachers feel more confident with the presentation of scale averages than with the display of single values or box plots. However, since the information on the variance of student perceptions as well as the individual item scores contain relevant information about one's own teaching (see Chap. 6 by Schweig and Martínez and Chap. 3 by Röhl and Rollett in this volume), a promotion of teachers' data literacy appears to be an important prerequisite for productive use (Schildkamp, 2019).

Findings from organizational psychology point out that the perception of the valence or positivity of feedback with regard to one's own actions is accompanied by a more precise reception, easier remembering of the feedback contents, and better acceptance of the feedback (Ilgen et al., 1979; Lyden et al., 2002). If feedback is perceived as negative, there is a tendency to adopt a defensive attitude, which serves to protect one's own self-concept, and so reduces the intensity of perception, the acceptance, and the willingness to change (Lechermeier & Fassnacht, 2018; Sedikides & Strube, 1995). In most cases, this defensive attitude is also expressed in an external attribution of the reasons for the negative feedback (see above). These reactions on the feedback valence are also found in the context of student feedback (Ditton & Arnold, 2004a; Rösch, 2017). However, whether the student feedback is more positive or more negative than teachers' self-perception has not been found to be significant for student feedback use (Buurman et al., 2018; Gaertner, 2014).

In organizational research, the specificity of feedback, i.e., the accuracy and extent of the exemplary reference to the task and its improvement, shows differential effects depending on the expertise of the recipient. Highly specific feedback leads to positive effects if the recipient is in an early exercise phase with regard to the task. However, long-term learning performance is negatively influenced by this highly specific feedback (Lechermeier & Fassnacht, 2018). On the other hand, low-specificity or summarized feedback, which refers to several tasks or a longer period, has the opposite effect: Short-term exercise performance is worse, whereas long-term learning performance is better. A tentative explanation is that low-specificity feedback could lead to an active search for possible improvements and a deeper processing of the necessary information, which in turn leads to deepening learning effects (Schmidt & Bjork, 1992). Since most teachers can be classified as professionals with many years of teaching experience, a less specific student feedback for this group could generate greater usage effects. More specific forms of feedback, which include concrete suggestions for improvement, could be beneficial for novice

teachers or in teacher training. In addition, in a discussion following the feedback, students can give important concrete advice on how to improve teaching (see also Chap. 12 by Schmidt and Gawrilow in this volume).

Studies on the effects of *timing* of feedback mainly refer to the accuracy of experimental learning tasks and distinguish immediate feedback from feedback given between 10 min and 24 h after completion of the learning task (Lechermeier & Fassnacht, 2018). The delay retention effect shown here, according to which late feedback leads to higher long-term learning success (Kulhavy & Anderson, 1972), seems to be based on the recapitulation of the associated learning content, which leads to a more in-depth memorization (Smith & Kimball, 2010). Since feedback from students to the teacher is usually only given after a certain time interval from the teaching activities, e.g., at the end of a lesson, week, or learning unit, these findings are only of limited significance for this context. However, Coe (1998) argues for the school context that feedback to teachers on students' learning achievement or teaching should be given as soon as possible in order to have the maximum effect on the further development of teaching.

Furthermore, a survey instrument which is valid and reliable should be selected for a successful use of student feedback (see also Chap. 4 by Bijlsma in this volume). However, it should also suit the age of the students and the type of teaching in which it is to be used. For example, a questionnaire designed for use in the context of self-regulated learning may provide little helpful information if it is used in the context of strongly teacher-directed learning.

3 Conclusion and Outlook on Future Practice and Research

This chapter summarizes existing evidence on the use of student feedback according to three relevant influencing factors: characteristics of the feedback recipient, characteristics of the organization, and characteristics of the feedback information.

The following personal characteristics of teachers which influence the use of feedback were identified: *self-efficacy, attribution styles, goal orientations, perceived trustworthiness and competence of students as feedback providers, data literacy, and age and professional experience*. The reported findings indicated relevant characteristics of schools as organizations: *feedback culture, leadership, safety, support measures, and perceived function of feedback as control vs. development*. Relevant characteristics of feedback information were identified as: *timeliness, comprehensibility, valence, and specificity*.

For many of the reported teacher and feedback characteristics only evidence from organizational research exists. Although some findings on teachers' use of feedback from colleagues or school leaders point to a transferability of results found to the school context, there are no or only rare studies which would confirm the results for the context of student feedback. Regarding the characteristics of schools as organizations, a little more is known from data use studies, but also only a few findings concerning student feedback exist. With regard to future research, we believe

that there is a particular need for complex intervention studies which examine the effectiveness of student feedback in teaching development while controlling factors identified as relevant.

The findings presented in this chapter reveal a number of indications for the beneficial use of student feedback in schools. Firstly, with regard to organizational conditions, it seems helpful to communicate student feedback as a learning opportunity for teachers and not as a control instrument. The school management should ensure a safe environment in order to realize the use of student feedback, especially in a collegial setting, and thus build up a feedback culture in the long term. Transformational and feedback-encouraging leadership can help to enable reflective and developmental processes in schools overall and so foster productive feedback use. Finally, and in the best case, student feedback can be implemented in such a way that, at the same time, support measures are in place for the joint development of teaching.

Positive experiences in dealing with student feedback can thus possibly also change teachers' attitudes toward student feedback, such as the perceived trustworthiness of students as feedback providers (Gärtner & Vogt, 2013). In addition, this could also have a positive influence on relevant personality traits such as self-efficacy, attribution styles, and goal orientations.

With regard to the preparation of reports from student feedback, it seems helpful to make it as comprehensible as possible, especially with regard to statistical parameters (Merk et al., 2019), but also to include information about heterogeneous views among students on individual aspects of teaching. Furthermore, it appears to be beneficial for the developmental use of feedback to enrich reports with concrete suggestions for improving teaching activities (specificity), especially for less experienced teachers. Moreover, positive results should be particularly emphasized, so that negative results can also be better accepted.

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