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Students' perception of teachers' two-way feedback interactions that impact learning

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Abstract

Teacher-student interactions are fundamental to learning outcomes. However, the facilitation of student-defined, in-class two-way feedback interaction is under-researched. The purpose of this paper is to share insights from Year 9 students ($N = 32$; age = 14–15 years), describing effective teacher's two-way feedback interaction through Respectful Inquiry (RI; asking questions, question openness, and attentive listening). Small-focussed group interviews were conducted and transcripts were inductively analysed to represent the conceptualised effective student-described teacher behaviour and associated learning outcomes. Findings confirm that two-way feedback, as opposed to unilateral teacher feedback, is facilitative of more diverse and higher-order learning outcomes. According to the students, RI is constitutive in the two-way feedback interaction process; executed together, positive psychological needs support and metacognition are fostered. While this research was exploratory, the findings offer practical and novel insights on teachers' two-way feedback interactions that can enhance students' metacognition and suggests how specific feedback behaviours augment higher-order learning outcomes.

Keywords Effective teacher · Respectful inquiry · Feedback

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1 Introduction

Feedback enhances learning outcomes (Hattie 2009). However, classroom feedback is commonly delivered by the teacher through unilateral, one-way messages, thereby limiting learning opportunities for students (Boud and Molloy 2013; Sadler 2010). One-way, monologic feedback assumes students are passive learners and fails to address learning misconceptions (Ajjawi and Boud 2017; Boud and Molloy 2013; Van den Berghe et al. 2013). Furthermore, as feedback includes emotional, relational, and social aspects (Carless 2013; Pitt and Norton 2017; Small and Attree 2016), how teachers fulfil these through two-way, dialogic feedback (Ajjawi and Boud 2017; Boud and Molloy 2013) in a secondary school context remains absent. To access higher-order learning and psycho-social outcomes, the inclusion of cyclical, dialogic feedback has been recognised as important (Ajjawi and Boud 2017; Boud and Molloy 2013; Price et al. 2011). These involve interactions between the teacher and students to "elicit perceptions and judgements, and discerning what is needed for improved action" (Boud and Molloy 2013, p. 709). However, qualitative research involving secondary school students' in-class perceptions and experiences of how effective teachers engage in such two-way feedback interactions to enhance learning outcomes such as metacognition has not been reported.

Pedagogical reasoning skills (Berliner 2004) that enable teachers to explicate particular concepts and highlight misconceptions (Gardner 1991) is reflective of quality teaching and learning. It is therefore imperative to understand students' perspectives of how effective teachers enact two-way feedback interactions to motivate, build relationships, and access learning outcomes. As interactions include both verbal and non-verbal aspects, we broadly define such behaviours as 'two-way feedback interactions'. In the present research, we explore teachers' specific verbal and non-verbal behaviours such as asking questions, question openness, and attentive listening through 'respectful inquiry' (RI; Van Quaquebeke and Felps 2018), a theoretical framework rooted in self-determination theory (Deci and Ryan 2000).

1.1 Feedback

Feedback, broadly speaking, is about closing performance gaps (Nicol and Macfarlane-Dick 2006) by providing 'information…regarding aspects of one's performance or understanding' (Hattie and Timperley 2007, p. 102). Accordingly, positive outcomes are accentuated when feedback is informative, specific, directive, goal-related, and delivered in non-judgemental language (Duijnhower 2010; Shute 2008; Van der Kleij et al. 2012). Consistent with this, studies have shown that when feedback actively nurtures students' ability to regulate their own learning (Nicol 2010; Price et al. 2010), this can accelerate the rate of learning through students' reflection, self-regulation (Zimmerman 2000), and increase performance outcomes (Fonseca et al. 2011). Conversely, negative outcomes may ensue if feedback is heavily cued, vague, limited to praise, or incomprehensible to the learner (Burnett and Mandel 2010; Hattie and Timperley 2007; Nett et al. 2012).

While the impact of feedback is well-established in extant literature, it is chiefly one-way (Sadler 2010; Van den Berghe et al. 2013), and its limitations must not be overlooked. Scholarly literature has argued that one-way feedback, while essential, is insufficient. Instead, scholars have advocated that feedback in general, should be viewed as a continuum (Knight 2003), and optimised through two-way dialogic feedback (Ajjawi and Boud 2017; Boud and Molloy 2013; Price et al. 2011). Executed together, there appears potential to enhance active learning, facilitate capacities for self-regulation, and avoid demotivation (Askew and Lodge 2000; Carless et al. 2011; Zumbrunn et al. 2016). However, research investigating secondary school student perceptions of teachers' effective two-way feedback interactions has received far less attention.

1.2 Two-way feedback interaction

Literature discussing two-way feedback interaction highlights its importance; however, the infrequent use of teacher-student interaction during the feedback process is problematic. Moreover, the student-perceived learning outcomes of such interactions through RI have not been reported. For example, Gamlem and Smith (2013) highlighted that two-way feedback interaction was beneficial to the overall feedback process, although they reported its use was rare. Moreover, the specific verbal and non-verbal feedback behaviours that students define as effective in such interactions remain unclear. In instances where marking rubrics were used as a form of feedback, studies have similarly reported that two-way feedback interaction is still needed to clarify expectations and individualised interpretation of comments (Chardon et al. 2011). Although the absence of two-way feedback interaction has been emphasised, research has continued to report that teachers' default mode of dispensing feedback remains unilateral rather than facilitative (Van den Berghe et al. 2013). Given that "feedback without engagement is completely unproductive" (Price et al. 2011, p. 894) and students are accorded "little volition, little agency, and (perpetuates) dependence on teachers" (Boud and Molloy 2013, p. 703), these sentiments underscore the importance of student perspectives of two-way feedback interaction. Therefore, the aim of this paper is to offer an extension of current literature to provide clarity on student perceptions of effective two-way feedback interactions, and the associated teacher behaviours that facilitate student learning outcomes.

Two-way feedback interactions elicit perceptions and judgements, and assist learners to define future action (Boud and Molloy 2013). Such interactions suggest latent potential in offering students the opportunity to clarify feedback, ensure understanding, and become agentic, independent learners (Mulliner and Tucker 2017; Price et al. 2011). Moreover, how two-way feedback interaction is initiated is worthy of consideration. Research has reported students' discomfort at initiating feedback dialogue with teachers (Small and Attree 2016) as they do not wish to impose on teachers' busy schedule (Robinson et al. 2013). In addition, the power imbalance further hinders students from initiating discussion, thus teachers are encouraged to take the lead (Blair et al. 2014). Despite literature reporting students' preference to interact with teachers on feedback (Chardon et al. 2011; Gamlem and

Smith 2013), research that explicates from the students' perspective of how teachers enact this will assist to further clarify teaching effectiveness.

Thus this paper explores, from the students' perspective, how teachers effectively enact these two-way feedback interactions through the lens of respectful inquiry (RI; Van Quaquebeke and Felps 2018). Whilst not previously used in educational research, RI (Van Quaquebeke and Felps 2018) articulates the verbal and non-verbal behaviours of two-way feedback interaction, as it occurs in the feedback process.

1.3 Theoretical framework

1.3.1 Respectful inquiry and self-determination theory

RI (Van Quaquebeke and Felps 2018) originated in managerial contexts involving conversations between supervisors and employees, where it is theorised to motivate followers (La Guardia et al. 2000). With its roots in self-determination theory (SDT; Deci and Ryan 2000), its use is relevant to the current work in two ways. First, RI refers to dialogue through question asking, use of open questions, and attentive listening when delivered in conjunction with feedback. Second, RI is based on SDT, a theoretical underpinning which has consistently served to explore supportive teacher behaviours that nurture psychological needs satisfaction, well-being, and performance (Jang et al. 2010; Reeve 2015a; Sparks et al. 2015; Whipp et al. 2014). Although SDT lays the foundation in explaining the nutriments for motivation and self-regulation, RI articulates in more specific ways, the actual behaviours that might be useful during two-way feedback interaction, thus providing us with more tangible handholds to aid our understanding on teacher-student interactive, dialogue-related feedback behaviours.

SDT states that all individuals have three basic and essential psychological needs—autonomy, competence and relatedness (Deci and Ryan 2000). Within SDT, studies have consistently shown that supportive environments and interpersonal relationships enhance need satisfaction, facilitates autonomous self-regulation, and positively relates to optimal performance (Gagné 2003; Gagné and Deci 2005; Ryan and Deci 2000, 2002).

Autonomy refers to a sense of feeling free from pressures and having the possibility to make choices among several courses of action (Guay et al. 2000). Autonomy supportive behaviours signal an interpersonal tone of support and understanding (Reeve 2015a), where student perspectives are acknowledged and non-controlling language is used (Reeve 2015b; Su and Reeve 2011). When autonomy is offered, students experience increased engagement, quality learning, greater intrinsic motivation, and enhanced academic achievement (Guay et al. 2008; Reeve et al. 2004).

Competence refers to the ability to effectively carry out certain planned behaviour, feeling accomplished and skilled in a specific domain. Competence support relates to the provision of structure, guidance, and feedback that influences students' perceptions that they have the ability to take charge of their learning, and are capable of self-regulating their learning strategies (Jang et al. 2010; Sierens et al. 2009; Skinner et al. 1998). Studies have reported its positive association with students'

behavioural, cognitive, and emotional engagement (Jang et al. 2010; Sierens et al. 2009; Skinner et al. 2008).

Finally, relatedness represents one's need for belonging, interpersonal security and connectedness. The provision of relatedness support occurs in the presence of affective support, commitment and friendliness in interpersonal relationships, which promotes student motivation, engagement, and self-efficacy towards learning (Sparks et al. 2015). Studies have also reported its positive influence on student motivation, engagement, learning, and its ability to mitigate academic failure (Davis 2003; Wang 2009).

These psycho-social relationships suitably underpin this research, because the provision of one-way feedback in isolation is not sufficient to accelerate learning outcomes (Lew et al. 2010), and as earlier mentioned, feedback is multifaceted—it includes the content, relational (Carless 2013; Watzlawick et al. 1967), and emotional aspect (Small and Attree 2016). Thus, our rationale for the use of RI is relevant when we consider the multifaceted complexity of feedback (Carless 2013; Small and Attree 2016; Pitt and Norton 2017). Here, we propose that through student perceptions of teacher's RI, further insight will be gleaned. While RI has not been utilised in educational research, its synergy with desirable teacher-student relationships solidifies its research potential.

1.3.2 Verbal behaviours (Asking questions, and use of open questions)

To understand how two-way feedback interactions facilitate learning, we first examine the literature on verbal behaviours, with specific focus on two aspects; the function of asking questions and question openness (Van Quaquebeke and Felps 2018). Defined, the intent of asking questions is to elicit an answer (Hawkins and Power 1999). The usefulness of teachers' RI in steering student thinking towards self-correction and repair during whole classroom settings (Chin 2006) is not new, though it has not yet been defined so precisely. While research has suggested that teachers' questions need to be genuine, supportive, neutral, and responsive towards students' utterances to promote self-correction (Chin 2006), students' perspective on teachers' two-way feedback interaction behaviours is unreported.

Whether questions are closed or open also matters. While all questions are aimed at inviting or "elicit(ing) a verbal response from those to whom the question is addressed" (Hawkins and Power 1999, p. 236), there are different degrees of openness eliciting different degrees of elaboration in the receiver's answer (Kearsley 1976; Reeve and Jang 2006; Thompson 1995). Question openness signals to the recipient that the listener is willing to listen. Closed questions, however, typically elicit a pre-determined answer, or yes/no response (Döş et al. 2016). Despite question openness potentially promoting reflective skills and quality thinking through explanations (Johnston et al. 2007; Lee and Kinzie 2012; Ogu and Schmidt 2009; Searle and Vanderveken 1985), these benefits have not been specifically addressed in the context of two-way feedback classroom interactions. Teachers' frequent use of closed, convergent and low-level cognitive questions that solicit factual recall, rules or procedures remain a concern (Bay and Alisinanoğlu 2013; Blatchford and Mani 2008; Döş et al. 2016; Wilen 1991). This is because the privation of question

openness and lack of intellectual stimulation potentially reduces learning to superficial forms of learning such as memory-recall (Lee and Kinzie 2012). The limited use of question openness by teachers (Massey et al. 2008; Walsh and Sattes 2005) potentially deprives students of a robust, engaging, and stimulating educational environment (Lee and Kinzie 2012). As such, this research seeks to determine from the students' perspective, how effective teachers use question asking and question openness during two-way feedback interaction, and the self-perceived learning outcomes that ensue.

1.3.3 Non-verbal behaviours

According to Van Quaquebeke and Felps (2018), apart from verbal behaviours, RI-related non-verbal behaviours are also salient. These include attentive listening behaviours such as eye contact, head nods, or appropriate facial expressions. Teachers' non-verbal behaviours have also been suggested to influence student perceptions of psychological closeness and attitudes towards learning (Andersen 1979; Witt et al. 2004). For example, a meta-analysis of 55 studies found a correlation of .49 between teachers' non-verbal behaviours and students' perceived attitudes towards learning (Witt et al. 2004). Moreover, it raises student motivation, enhances prosocial classroom learning outcomes, energy, and promotes engagement with the subject (Allen et al. 2006; Frymier 1994; Mazer 2013). However, what remains unknown is the student-perceived, effective teachers' non-verbal, two-way feedback interaction behaviours that facilitate students' higher learning outcomes such as metacognition. This is important because teachers' quality interaction and instruction forms an intricate, complex web of interconnected experiences for students that define, shape, affect, and impact motivation towards learning (Jackson et al. 2013; Kyriakides et al. 2013; Sparks et al. 2015). As such, this research seeks to address this lacuna by investigating students' perspectives on how teachers' two-way feedback interaction (verbal and non-verbal behaviours) might facilitate learning outcomes.

1.4 Student learning outcome: metacognition

Instrumental to student development and academic success (Winne and Nesbit 2010) are learning outcomes such as metacognition (Jansen et al. 2015; Magno 2010). Metacognition is a disposition of thinking and learning (Harpaz 2007), exemplified by "the knowledge, awareness, and control of one's own learning" (Baird 1990, p. 184). According to Flavell (1976), metacognition relates to an individual's self-awareness and knowledge about the cognitive processes necessary for understanding and learning. It consists of two key aspects, namely knowledge of cognition, and regulation of cognition (Flavell 1987). Individuals who are metacognitively aware are cognizant of what they know and where they lack knowledge; they know how to regulate or adapt their cognitive mental processes, resulting in improved efforts to retain or seek out new information (Dunlosky and Metcalfe 2009; Zhao and Mo 2016). Although feedback effectiveness is dependent on student's ability to

self-regulate their learning (Kluger and DeNisi 1996), there has been little attention on how this may be achieved (Hattie and Timperley 2007).

For instance, while research has explored metacognition in the feedback literature through computer-based learning environments (Lee et al. 2010) and experimental settings (Labuhn et al. 2010; Miller and Geraci 2011), little is known about teachers' two-way feedback from the students' perspective, and how it enhances metacognition. For example, in Miller and Geraci (2011), the provision of explicit and concrete strategies as feedback was useful in raising students' awareness of cognition, but insufficient to promote the other aspect of metacognition, that is, the regulation of cognition. Lee et al. (2010) suggested that the provision of corrective feedback on right/wrong answers and feedback statement prompts to revise learning material would serve to raise students' cognitive awareness. However, these feedback prompts were administered as statements rather than questions through a computer, and teachers' actual two-way feedback interactions and associated behaviours remain unreported. As feedback carries more than just content (Carless 2013) and connects the student to teacher, it is also meaningful to investigate how students receive it (Hattie and Gan 2011), and how it influences metacognition.

1.5 The present study

This study closes gaps in the above literature by exploring student perceptions of teachers' two-way feedback interactions through the utility of RI, and how they serve to impact students' metacognitions. Qualitative research involving interviews with small groups of students was employed.

2 Method

2.1 Participants and procedure

Participants ($N=32$) were Year 9 students (16 male and 16 female) from six independent schools within the Perth metropolitan area of Western Australia, comprising two all-girls, two all-boys and two co-ed schools. Student volunteers participated in one semi-structured interview session, lasting approximately 45 min in length. With teacher guidance, participants were screened to ensure a range of academic performance across classes from each school. Interviews were conducted in groups of three or four and all identifiable information of students, teachers or schools has been removed to protect and uphold participant anonymity.

With permission and approval from the Human Research Ethics Board, research letters were sent to the principals of independent secondary schools in Perth metropolitan area. Participants-to-be were invited with an information letter identifying the purpose, procedures, benefits and risks. Participant passive consent was approved given the study's non-invasive and confidential nature, as well as the maturity level of the student participants. Parent information sheets included the study requirements with a withdrawal form attached, should they exercise a preference for

their son/daughter not to participate in the study. All participation was voluntary, with capacity to withdraw at any time, and anonymity assured. The interviews were held in the final 2 weeks of the year, as participants had experienced the full length of the year and therefore were better positioned to share their classroom experiences. All interviews were audio-recorded using a digital voice recorder and conducted during school hours in a designated quiet room on school campus.

Correspondingly, student interviews provided insight and depth in understanding through probing questions (Tuckman 1972) on what effective teachers say and do that serves to facilitate learning. The interview guide was peer-reviewed by experienced academic staff and researchers ($N=3$) for suitability, comprehension and rigour. Interviews were conducted by highly-experienced research educators ($N=2$). To facilitate discussion, an interview guide, with a definitions page and interview questions was provided to the student participants at the time of recruitment, and at the beginning of each interview, with opportunity for clarification during the interview.

The interview questions focused on two-way feedback interactions through RI, investigating teacher behaviours that were perceived by students as facilitative towards their learning. Students were asked to reflect on teachers whom they experienced as effective in enhancing their learning through feedback. Examples of questions include: "Do teachers ask you to talk about how you could improve your work?", "How do effective teachers engage you in feedback conversation?", "How do effective teachers use questions to help you during feedback?". Students were encouraged to discuss and elaborate their answers through the researcher asking questions such as "What do effective teachers say and do that help you to engage with feedback?", "How do you know if teachers are genuinely interested in what you have to say?" Saturation, as indicated by no new themes, issues or data emerging from the final interviews (Miles and Huberman 1990), was applied to prevent incomplete data collection (Cavanagh 1997; Guest et al. 2006).

2.2 Data analysis

In order to ensure trustworthiness of the data collected, a variety of methods were utilised. Student responses were paraphrased by the interviewer, and students were given the opportunity to clarify their comments. Saturation was confirmed upon analysis of the final four transcripts, where all data collected replicated existing themes, and there were no new meaningful codes emerging (Cresswell 2007).

The first author transcribed the interviews verbatim, analysed the RI concepts inductively and placed them into categories which adequately represent the conceptualised behaviour and the outcomes (Elo and Kyngäs 2008). Repeated reading and listening of audio-recordings assisted to ascertain a general sense of content prior to in-depth reflection of their collective meaning (Cresswell 2007). Data were subsequently reviewed for content and coded for correspondence according to the identified categories (Polit and Beck 2012).

Subsequently, clusters of meaning units were used in theme development (Braun and Clarke 2006) as initial conclusions. Units were represented by phrases, words,

letters, sentences (Robson 1993) or a paragraph containing conceptually relevant information. In order to establish accuracy in interpretation, direct quotations from participants are presented in the results section, alongside detailed descriptions of theme definitions (Cresswell 2007).

Coding sheets were subsequently cross validated (Burns 1997) using three experienced research university staff after initial conclusions were made by the first author. Meaning units were checked for consistency in themes, behavioural indicators and outcomes. Discussions were held with the second and third authors, experienced researchers knowledgeable in qualitative methodology, to examine the interpretations of initial coding and themes and methodological procedures (Patton 1990). Initially, 86% agreement was reached between independent coders. This percentage agreement was calculated based on the number of quotes that the coders were in agreement with, out of the total number of quotes. Further corrections were made until final agreement was reached between researchers and coders.

3 Results

Fourteen small-group interviews were undertaken, resulting in 75 pages of 11-point, single-spaced transcribed text. A total of 82 meaning units were recorded for two-way feedback interactions. Themes were classified according to effective teachers' two-way feedback behaviours through RI (Table 1), and the student-perceived outcomes (Table 2). The rate of recurrence in meaning units provide awareness of the recurring themes as perceived by students, and are not an indicator of importance, they are presented for illustrative purposes (Sparks et al. 2015).

3.1 Student perceptions of effective teachers' two-way feedback interaction behaviours

Effective teachers' feedback interaction behaviours are summarised in Table 1. Three themes were constructed within RI: Asking questions, question openness, and attentive listening.

The first theme, asking questions, refers to an invitation for an answer (Hawkins and Power 1999). Citing student commentary, students reported that teachers' questions invited them to respond. For example, "Teachers are interested…they ask you more questions…they genuinely want to listen to your answer" (F, all-girls), and "(Teachers) asking questions can be a good thing because they make you feel like they are really interested in what you have to say" (M, co-ed).

The second theme, question openness, was related to a genuine interest in opinion seeking, characterised by open questions (Van Quaquebeke and Felps 2018). Examples of teachers' question openness during two-way feedback interaction include; "What are your thoughts on this?" (M, all-boys), and "Why is this so? You've got more" (F, co-ed). Another student believed metacognition during feedback interaction was encouraged;

Table 1 Student perceptions of effective teachers' two-way feedback interaction behaviours

Lower-order theme	Definition	Exemplar meaning unit
Asking questions (6)	Examples of teachers' questions that invite an answer	"…they ask you questions to expand on it…" (M, all boys)
Question openness (12)	Examples of teacher-student interactions characterised by open questions, and a genuine interest in opinion seeking	"She starts a discussion with you, not just tell you to do this. She goes, 'what else do you think you could add here?'" (F, all-girls)
Listening with Attentiveness (24)	Examples of teacher behaviour that demonstrates adequate eye contact and appropriate facial expressions or head movements that reflect understanding	"They're engaged with you…eye contact and show a lot of facial expressions…show that you are on the right track and they like what they are hearing" (F, all-girls)

> Researcher: "So how did your teacher explain the areas of improvement in your work?"
> Student: "… before she gives us any ideas, she'll come to us and ask, 'Where are you going next? What are you going to…how can you make this better without me?'… that kind of thing" (F, all-girls).

The use of open questions was also explicitly highlighted by students that it encouraged them to express their opinions. An example includes;

> "Generally the question's open-ended… 'Why is that?', extending the question, making you give (an) open-ended response. Makes it sound like they want to hear your views … not just a yes or no answer" (M, all-boys).

The third theme was attentive listening (Van Quaquebeke and Felps 2018), evidenced by behaviours which include eye-contact, appropriate facial expressions and head nods. Citing two examples; "…a lot of eye contact, nodding" (F, all-girls), and "they do not stop looking at your eyes….kind of …I am really listening. I'm so involved in what you are saying" (F, co-ed). Others expressed the sense of care felt when teachers enacted attentive listening behaviours. For example, "When they nod or comment back or do those things that make them seem involved…its good—you know they are listening and …makes you feel quite nice because they want to help" (F, co-ed).

3.2 Student perceptions on the outcomes of teachers' two-way feedback interaction

The outcomes of teachers' two-way feedback interaction (RI) outcomes (Table 2) were coded according to two themes within metacognition: Knowledge of cognition, and regulation of cognition (Flavell 1979).

Student commentaries confirm that teachers' two-way feedback interactions through RI helped create deeper awareness of student thinking and understanding of feedback. For example, "…(my teacher) asks me questions…it really encourages

Table 2 Student perceptions on the outcomes of effective teachers' two-way feedback interaction

Theme	Definition	Exemplar meaning unit
Metacognition (self-awareness of cognition) (16)	Student commentary that teachers' open questions have been helpful in facilitating awareness of cognitive processes	*(Researcher: Does your teacher's use of open questions during feedback enhance your understanding of class work?)* "It does. Because it like really requires you to think about it. So when they ask you, you need to think about it the answer so it challenges you, like pushes you to think about and find the answer." (M, all-boys)
Metacognition (regulation of cognition) (24)	Direct student commentary on their confidence in adapting their cognitive processes resulting in improved efforts	"Well it helps because then if we're doing it at home, and we're kind of stuck, we can kind of say hey, we can do it for ourselves, we know what to look for …and don't always need the teacher's help." (F, co-ed)

you to expand your reasoning and explain your reasoning rather than just stating something" (M, all-boys), "…sometimes they can make you think like from different points of view" (F, all-girls), and "I think (RI) motivates you to think critically about what you're doing" (M, all-boys).

Coded under the theme of regulation of cognition, students described how teachers' two-way feedback interactions helped to guide their own understanding and learning to improve learning outcomes. For example, two students reported that when the feedback process included submission of self-reflection from one-way feedback and subsequent two-way feedback interaction unfolded with teachers, this was beneficial to learning. For example, "I find in English, like after our test … you have to write … like what could I improve and how can I improve… that really helps, because then you'd spot your mistakes as well" (F, all-girls). Another example includes: "My teachers' (two-way) feedback makes me think about it and say, yes, I could've …done that better…yeah, I understand where I went wrong and …you do your own personal reflection" (F, co-ed). Other students also reported that being engaged in one's own self- reflection helped them develop an awareness of mistakes and deeper understanding of learning gaps.

4 Discussion

This study explored student perceptions of teachers' two-way feedback interactions through RI (Van Quaquebeke and Felps 2018), and the associated self-perceived student learning outcomes. Considerable research has suggested that metacognition, that being the capacity to control one's own learning (Baird 1990), may be supported by various types of feedback (Schunk and Swartz 1993; Shih and Alexander

2000; Labuhn et al. 2010). This study offers practical insights, based on student perspectives, on the specific two-way feedback interaction behaviours which are perceived as effective in augmenting students' metacognition.

As this research was exploratory, the methodology used in this study enabled students to articulate more descriptively how teachers used supportive RI behaviours (Van Quaquebeke and Felps 2018) when enacting two-way feedback. Analyses identified three behaviours supportive in feedback.

First, teachers' use of verbal behaviours in question asking and question openness conveyed intent to listen and understand students' thinking. Effective teachers provided routinised opportunities for students to articulate their opinions and construct self-determined improvements. According to student commentary, these teacher behaviours encouraged regular reflective thinking, and not just episodically. Furthermore, teachers' acknowledgement of students' input during the feedback process reported in this study has synergy with behaviours that facilitate autonomy support (Reeve 2015a, b; Su and Reeve 2011). When two-way feedback is enacted, students reported feeling empowered; students felt more capable, engaged, and agentic in their ability to evaluate their work, suggest corrective repair, and regulate their learning. These results are in agreement with others that positive outcomes ensue when students' autonomy is supported (Jang et al. 2010; Sierens et al. 2009; Skinner et al. 1998; Reeve 2015b). Although there has been little focus in the literature on how teachers successfully promote students' cognitive self-regulation through feedback (Hattie and Timperley 2007), the results of this study articulates possibilities through RI (Van Quaquebeke and Felps 2018).

Second, teachers' non-verbal attentive listening behaviours were ascribed by students to communicate care, understanding and support. Teachers' eye-contact, smiles, and head nods during two-way feedback interaction encouraged rapport and were ancillary in fulfilling the relational aspect of feedback (Carless 2013; Pitt and Norton 2017; Small and Attree 2016). These results are also in agreement with recent literature that meaningful teacher-student relationships create relatedness needs supportive learning environments (Sparks et al. 2015; Davis 2003; Wang 2009). Interestingly, these results also demonstrate that students are keenly aware of effective teachers' supportive behaviours that facilitate learning through feedback. While Sparks et al. (2015) also contend that teachers who nurture students' psychological needs satisfaction enhance intrinsic motivation, engagement, and self-efficacy, these outcome variables were not investigated here. As an extension to this work, future research could examine these to enhance our understanding.

While RI has been theorised to motivate followers (La Guardia et al. 2000) in the business context, this study offers furtherance by explicating the specific ways in which this is realised within the educational context. According to students, two-way feedback interaction through RI provides clarity of task, raises awareness in current thinking, augments independent repair of learning gaps, and inspires self-regulation of cognition in students. As scholars have previously lamented that one-way or unilateral feedback perpetuates dependence on teachers (Boud and Molloy 2013), these practices by effective teachers are noteworthy. In addition, this study provides teachers with practical strategies to model RI (Van

Quaquebeke and Felps 2018), underscored by the student-reported influence it has on supporting their metacognition, which is instrumental to the attainment of academic success (Jansen et al. 2015). Executed routinely, RI (Van Quaquebeke and Felps 2018) has the potential of honing students' thinking skills and self-regulatory processes.

Lastly, interesting parallels may be drawn between effective teachers and business leaders. As effective business leaders are characterised by their involvement, skilful questioning and follow up (Goldsmith and Morgan 2004; Schein 2013), this study suggests that the student-identified effective teachers bear similar attributes in the way they carry out two-way feedback interaction. However, as these teachers are unverified experts or leaders, future research to confirm this appears warranted.

4.1 Limitations and implications for future research

These findings, while insightful, provide only partial understanding as only student perspectives were sought and may hold unqualified assumptions. In addition, although interviewing students at the end of the year may provide a more holistic account of how students perceive feedback, it is unclear if sentiments would remain constant if students were interviewed at other times. Moreover, in typical classrooms, teachers may not have a lot of time one-on-one to provide such feedback. Different subject areas may also be predisposed to greater opportunity for discussion and inquiry. Future empirical observations may extend our understanding of how teachers do this effectively in class sizes ranging from 20 to 35.

Hence, triangulation of what these effective teachers themselves say would be needed to confirm this. At this point, a follow-up study involving student-identified effective teachers is underway to evaluate findings from this paper. The findings here need to be read with caution as they lack cross-cultural research verification (e.g., Western and non-Western countries).

We suggest our study has some practical implications for teachers. To nurture students' metacognition, teachers need to be intentional and seek out opportunities to facilitate two-way feedback interactions underpinned by RI. However, teachers may need support in utilising question openness, and possibly a less crowded curriculum for two-way feedback interactions to occur. In contrast to one-way feedback, two-way feedback interaction is individualised, contextualised and unique to each student. To begin, professional development programmes on the use of RI may provide useful support in helping teachers become effective. We hope that this work illuminates the specific two-way feedback interaction behaviours that influence student learning and encourage the propagation of more empirical research to advance our growing knowledge in this area.

As two-way feedback interactions through RI is nascent in the educational context, we propose five research avenues. First, as this is the first research exploring student perceptions on RI in two-way feedback, we recommend similar interviews with students (Year 9) of different abilities such as low and high ability, across different time frames in the school year such as the middle and at the end, to ascertain if results would differ from our findings. The inclusion of performance-based

outcomes could also be included to supplement qualitative findings. Second, empirical research investigating classroom observation of teachers to record the occurrence of two-way feedback interactions across different subject areas would be beneficial. This knowledge could afford practical benefits for educators and administrators interested in raising the quality of learning in the classrooms. Third, empirical research evaluating the interactive strength and effect of teachers' two-way feedback interaction through RI, together with the comparison of its utility on students with high ability and low ability with metacognition, self-efficacy and motivation would provide valuable knowledge. Fourth, a comparison of early career teachers and experienced teachers' use of two-way feedback interaction through RI, and its impact on students' self-efficacy, metacognition, and motivation would further extend our growing knowledge of the impact of teaching experience on the utility of two-way feedback interactions. Finally, as there is currently no validated evaluative tool to measure the prevalence or impact of RI in schools, the development of such an instrument would provide researchers greater access to insights on teachers' two-way feedback interactions to support student learning.

5 Conclusion

In sum, RI (Van Quaquebeke and Felps 2018) provides an innovative lens to view the ecology of two-way feedback interaction and suggests that effective teachers enact these to augment students' metacognition. This work has contributed to the literature by articulating the specific teacher behaviours pivotal in the two-way feedback interaction process and suggests that the utility of RI (Van Quaquebeke and Felps 2018), underpinned by SDT psychological need supportive behaviours (Deci and Ryan 2000), provides greater clarity for educators in terms of how and why it is impactful.

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