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Abstract: *Feedback can promote teacher-student relations and student academic involvement, performance and self-regulation. However, some research indicates that teachers do not always employ feedback effectively. There is a need to promote teachers' appropriate use of feedback in the classroom. We describe a long-term workshop designed to enhance teachers' knowledge and skills in the use of feedback strategies, and appreciation of the importance of feedback. Twelve teachers participated in the workshop. Observations as well as teacher reports indicate that participation in the sessions and the follow-up classroom application enhanced teacher involvement, knowledge, competencies and positive feelings in the use of feedback strategies. A workshop for teachers that has specific objectives on feedback strategies, is presented along a school year, and involves reflective sessions intertwined with classroom application work, can effectively promote participants' involvement, knowledge and competencies in the use of feedback, as well as their outlook toward the importance of these strategies.*

Teacher feedback about a student's performance and understanding may constitute the most important practical aspect of the relationship between teachers and students (Black & Wiliam, 1998; Black, Harrison, Lee, Marshall, & Wiliam, 2002). In addition to influencing student understanding and performance (Kluger & DeNisi, 1996, 1998; Ponte, Paek, Braun & Powers, 2009; Salema, 2005; Valente, 1997; Zimmerman & Schunk, 2001, 2007), teacher feedback plays a key role in student engagement with the school (Carvalho, Freire, Conboy, Baptista, Freire, Azevedo, & Oliveira, 2011; Conboy & Fonseca, 2009; Fonseca, Valente, & Conboy, 2011; Fonseca & Conboy, 2006; Fredricks, Blumenfeld, & Paris, 2004; Schussler, 2009; Veiga, 2009; Verkuyten & Thijs, 2009). It also impacts the construction of student identity and academic trajectories (Cornelius & Herrenkohl, 2004; Solomon, in press). Specifically, as a

component of the quality of the relationship that teachers develop with their students, feedback – along with the types of tasks and activities teachers propose – will affect the contexts of participation and can act to reify perceptions of identity (Carvalho & Solomon, 2012; Freire, Carvalho, Freire, Azevedo, & Oliveira, 2009. In spite of its importance, some evidence points to a possibly widespread teacher misapplication of feedback in the classroom (Tong & Adamson, 2015; Valente, Conboy, & Carvalho, 2009), and a consequent need for specific teacher education in this area.

Effective Feedback: Evidence, Structure, Consequences

Feedback occurs after a fact, and consists of the information we receive about how we are doing in the effort made to reach a certain goal (Wiggins, 2012). Feedback is always a consequence of how we perform and its instructional purpose is to provide information related to a task or learning process, in order to improve performance in a particular task and/or understanding of a particular subject (Sadler, 1989). According to Hattie (2009), feedback aims at the reduction of discrepancies between current understandings and performance on the one hand, and a learning intention or goal on the other.

Feedback has been described by different authors as having cognitive, motivational and affective dimensions. The cognitive dimension of feedback can be understood as "information provided by an agent (e.g. teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (Hattie & Timperlay, 2007, p. 81). Such information can have an impact on student performance and self-regulated learning (Kluger & DeNisi, 1996, 1998; Salema, 2005; Valente, 1997; Zimmerman & Schunk, 2001, 2007).

Brookhart (2008, 2) describes effective feedback in terms of both cognitive and motivational dimensions. The cognitive dimension is composed of providing students information necessary to understand "where they are in their learning and what to do next" ; the motivational dimension involves students developing "a feeling that they have control over their own learning".

The literature also indicates that feedback strategies are a relevant factor in promoting the affective relation between teachers and their students, as well as students' involvement, performance and self-regulation (Black et al., 2002; Black & Wiliam, 1998; Hattie, 2009).

Dweck (2006) theorizes that the nature of feedback influences motivational mindsets (mere Performance vs. Mastery). In short, if teachers' feedback rewards speed, then speed will be what the student learns; if feedback shows preference for getting *the* right answer, then students will strive to get *the* right answer. But, if feedback is structured to recognize and compensate effort, persistence, and the application of principles, then students will learn to work hard, persevere, and think.

Black and Wiliam (1998) synthesized the results from 250 international studies on classroom assessment, and concluded that two teacher actions provide a more powerful impact on learning than any other educational innovation ever documented: (1) involving students in assessment; and (2) increasing the amount of descriptive feedback while decreasing evaluative feedback. Hattie and Timperlay (2007), using a meta-analysis approach, concluded that substantially higher effect sizes are observed for feedback strategies than for most typical educational interventions. Such findings on the importance of feedback have given rise to a

movement that values assessment *for* learning, as opposed to assessment *of* learning or assessment *as* learning (Black & Wiliam, 1998; Wiggins, 2012).

There is a general consensus that feedback should be given at a level that students can understand (Orsmond, Merry, & Reiling, 2005), and it is more effective at promoting learning and facilitating improvement if it is provided in an enabling environment instead of being offered as judgment (Weaver, 2006). According to Hattie (2009), feedback can be directed to different levels: (a) the task (how well tasks are performed); (b) the processing of the task (the process needed to perform tasks); (c) self-regulation (self-monitoring of actions); and (d) the self (personal evaluations of learner). As such, Hattie (2009) indicates that the strategies adopted by teachers and students to reduce discrepancies will be related, in part, to the level at which the feedback takes place:

> If feedback is directed to the right level, it can assist students to comprehend, engage or develop effective strategies to process information intended to be learnt. To be efficient, feedback needs to be clear, purposeful, meaningful and compatible with students' prior knowledge, and to provide logical connections. (177-178)

Feedback is more effective, according to Hattie (2009), when it confirms the student's performance, when it focuses on ways to improve performance, and when it is supplied in contexts that protect student identity and self worth. Some studies also show that students appreciate, and yearn for, effective feedback, not just because they want to obtain grades that allow them to pass, but because they seek to develop their skills (Higgins, Hartley, & Skelton, 2002; Orsmond et al., 2005; Valente et al., 2009). However, in a recent study conducted in Hong Kong, Tong and Adamson (2015) reported that fewer than half of their student participants believed that feedback provided through school-based assessment was useful.

When Feedback Goes Wrong

The affective dimension of feedback is of particular importance when the information conveyed by the teacher focuses on the student rather than on the performance or understanding. This kind of feedback can have undesired results and increase the fear of failure. Feedback provides information that allows students to make interpretations about themselves, about others, and about the school. However, if the affective component of feedback is misjudged by a teacher, students may try to avoid the risks involved in tackling a challenging assignment by minimizing their effort, in order to minimize the risk to the self (Black & William, 1998). This happens most often when feedback is structured to emphasize aspects of the self which may influence not only the decisions students makes about the school (Freire et al., 2009), but also how they position themselves in the school community (Hand, 2006; Holland, Lachicotte, Skinner, & Cain, 1998).

Other literature shows that students sometimes do not respond well to feedback, since it can be misunderstood (Lea & Street, 2000), it may not be attended to (Hounsell, 1987), or it may be attended to but not acted upon (Ding, 1998). Furthermore, even when everything seems to be done pedagogically correctly, feedback may not have the desired effect on learning (Fritz, Morris, Bjork, Gelman, & Wickens, 2000; McClellan, 2001).

Recent research conducted in Portugal suggests that too often teachers employ assessment feedback in the form of statements about students, themselves, as opposed to

statements about the task, task processing and self-regulation (Valente et al., 2009). The authors described secondary-level teacher methods of presenting assessment information, student reactions to receiving such information, and how this dynamic may affect student engagement in school activities. Results supported the contention of Schussler (2009) that feedback practices that do not motivate the acquisition of knowledge and skill development by the student, and do not promote a student-teacher relation based on respect and trust, may have an adverse effect on students' academic engagement.

One salient finding of the study described by Valente et al. (2009) was that misuse of teacher feedback seems to be common. Rather than having the objective of focusing on the task and reducing performance discrepancies, feedback was frequently centered on the student self and used by teachers to accuse, judge and punish. This kind of feedback will not be effective in promoting learning and shows, once again, how the affective dimension of feedback can act as a double-edged sword (Kluger & DeNisi, 1996). Based on these findings we conclude that, in Portugal, there is a need for additional emphasis on programs of teacher education that assure feedback strategies are used in classrooms in an appropriate and efficient way.

What Teachers Need to Know about Feedback

Adequate preparation in the use of efficient feedback implies the development of appropriate skills so that teachers can aid students to better understand where they are in relation to learning goals and where they made mistakes and how to address them, while at the same time protecting student self-worth. Diverse approaches to feedback have been defended by various authors in the preceding paragraphs. In order to develop a theoretical framework appropriate for programs of teacher education, we consider what these approaches have in common and, using Brookhart's (2008) morphology of *Strategies* and *Content*, we can summarize some common characteristics of feedback.

Feedback *Strategies* can be described in terms of (a) *Timing* (when feedback is given, and how often); (b) *Amount* (how much feedback); (c) *Mode* (oral, written, or visual/kinesthetic feedback); and (d) *Audience* (individual, group, class feedback). Feedback *Content* can be described and assessed in terms of (a) *Focus* (work, process, self-regulation); (b) *Comparison* (criterion- , norm- , self-referenced); (c) *Function/Valence* (description, judgment / positive or negative valence); (d) *Clarity/Specificity*; and (d) *Tone* (shows respect to student; student recognized as agent).

In order to be effective, classroom feedback should have identifiable characteristics that are, importantly, under the partial control of the teacher. Effective feedback is presented as soon as possible after the fact (*Timing*) and is selective. That is, teachers should not attempt to comment all aspects of students' performance, but rather target specific aspects that will have the greatest effect (*Amount*). Feedback can be effective whether it is oral, written or visual and whether it targets an individual or a group. Teachers should recognize that each situation may lead to a preferred *Mode* and *Audience*.

The content of effective feedback can be described in a similar manner. Teachers require the skills to be able to examine and critique their own feedback practices. Do they tend to emphasize the student's work, the cognitive process or questions of self-regulation (*Focus*)? When identifying performance/ goal discrepancies, are these criterion-based, norm-based or

based on the student's prior performance (*Comparison*)? Are teacher comments descriptive or judgmental? Are they positive or negative (*Function/Valence*)?

Finally, is the information presented about performance/ goal discrepancy understandable and actionable (*Clarity/Specificity*) and is it sensitive to potentially unequal power relations in the classroom and concerns for student self-worth (*Tone*)?

These characteristics of feedback strategies and content are not intended to be isolated and orthogonal dimensions. They are inherently interrelated. A program of teacher education should seek to prepare a teacher who is skilled in identifying classroom practice choices and their potential effects. Such a teacher will promote interactive, descriptive communication, rather than one-way judgmental communication and will focus on the student's work and not on the student. Such a teacher will be frank about performance /goal discrepancies while, at the same time, sensitive to concerns for student self-worth. Such a teacher will contribute to an environment of openness and mutual respect that empowers students' control over their own learning.

How to Promote Teacher Learning on Feedback

Can a teacher education intervention help teachers to construct knowledge, skills and attitudes toward efficacious use of classroom feedback? Research shows that student achievement can be directly related to the investment and support of professional development for teachers (Jaquith, Mindich, Wei, & Darling-Hammond, 2010) and that teaching quality is directly related to the quality of professional development that teachers receive (Guskey & Yoon, 2009). Lawless and Pellegrino (2007) argue that high-quality education and development programs for teachers must be long in duration (contact time and follow-up/classroom application), actively engage teachers in meaningful activities for their individual classroom contexts, promote peer collaboration and community building, and have a clearly articulated vision for student achievement. Other authors recommend a similar structure in order for teacher education to be effective. It should provide for (a) emphasis on specific objectives; (b) integration of theory and practice; (c) long-term implementation (distributed along a school year or more); (d) application to the classroom; and (e) collaborative reflection by peers (Dana, Campbell, & Lunetta, 1997; Fonseca, 2002; Fonseca, Conboy, Macedo, & Mestre, 2004; Hattie & Timperley, 2007; Salema, 2005). In order to have a lasting effect, teacher education must link what teachers learn to what is really going on in the classroom (Hodge, 2014). Additionally, the teacher education program should be embedded in the instructional context of the classroom, that is, aimed at improving the relationship between academic instruction by the teacher and students' motivation to learn. Thus, a teacher education intervention should identify teachers' initial feelings and beliefs toward using feedback in their classrooms and should evolve by changing and improving upon the initial beliefs through powerful pedagogical strategies such as peer teaching in a community of practice (Garbett, 2011), modelling relevant concepts, hands-on and role-play activities, and collaborative reflection on those beliefs and framework of understanding about teaching.

Objectives

The purpose of this paper is to describe and evaluate a workshop that sought to promote teacher development in the use of appropriate and efficient feedback strategies. The study is of a qualitative and descriptive nature, and involves an analysis of the workshop sessions and of the autonomous work of participants (the classroom application of the sessions' content and objectives). We analyse the results of the workshop in terms of perceived changes in participants' knowledge and skills in using feedback strategies and their appreciation of the importance of these strategies. Specific data collection methods included observation, written reports requested from the participants, and collaborative reflection between teacher educators and participant teachers.

Method

Workshop Overview

The workshop was structured in eight three-hour sessions, distributed one per month from October to the end of May. There were seven teacher educators involved in the workshop. Two of the educators were workshop coordinators, the first two authors of this article. Each educator was responsible for one session and the corresponding classroom application. Each session was taught in a team-teaching approach by two of the teacher educators; one was responsible for the particular session and the other was always one of the coordinators. The presence of at least one of the coordinators in each session assured the continuity and articulation among all the sessions. To ensure consistency among educators, regular collaborative reflection meetings of the seven educators were held.

The desired outcomes of the workshop were greater teacher knowledge and skills in the use of appropriate and efficient feedback, positive feelings toward the importance of feedback strategies, and the actual application of such strategies in the teachers' classrooms.

The workshop, integrated in a larger research project, included topics such as: (a) Teacher feedback, student involvement, identity and academic trajectories; (b) Observation and analysis of feedback strategies; (c) Communication strategies and cognitive processing; (d) Feedback types and strategies and their consequences in a context of student identity and motivation; (e) Verbal and non-verbal feedback in collaborative work situations; (f) Feedback in problem-solving contexts; (g) Reflection on participants' convictions about student motivation factors and the role of feedback; and (h) Workshop evaluation, participant expectancies and realizations, difficulties and successes.

The workshop sessions included the presentation, discussion and, sometimes, simulation, by educators and teachers, of some feedback strategies and content, followed by application activities in working groups of participants (games, simulations, role playing and so on). Autonomous work for each session was always carried out outside the scheduled sessions, and included the application of feedback strategies in the teacher's own classroom and reflection on the effects of these strategies.

Workshop Structure, Participants and Context

Workshop planning and design followed literature-based recommendations for the preparation of this type of teacher in-service development. The structure provided for (a) emphasis on specific objectives; (b) integration of theory and practice; (c) long-term implementation (distributed along a school year); (d) application and collaborative reflection by peers (Dana et al., 1997; Fonseca, 2002; Fonseca et al., 2004; Hattie & Timperley, 2007; Salema, 2005); and (e) an interconnection between what teachers learn and what happens, in fact, in their classrooms (Hodge, 2014).

Twelve teachers from a school in the greater Lisbon area volunteered to participate in the workshop. All participant teachers had more than five years of teaching experience and were from the curricular areas of English, Geography, Physics-Chemistry, History, Mathematics, Economy and Portuguese. Six of the twelve teachers had done post-graduate work in their academic careers. Students of these teachers ranged from the 7th to the 11th grades. The workshop took place on the school premises following the establishment of a protocol between the school and the Education Institute of the University of Lisbon.

The school is located in a neighbourhood with high population density, and generally low-income families. The school population is characterized by cultural heterogeneity, with students from Portugal, from other Portuguese-speaking countries such as Angola and Brazil, but also from Ukraine, Moldavia, Romania, Pakistan and India. While this multiculturalism can have benefits, it also raises relational and language issues. Problems have been identified in this school related to indiscipline and violence, high retention and dropout rates, and little family-school involvement.

Session Details

The exploration of feedback through group activities illustrated the concepts and issues introduced in the session. In some sessions, for each working group, an ‘observer’ and a ‘teacher’ were designated. In other sessions, the ‘teacher’ was the educator herself. The observer registered the feedback comments used by the appointed ‘teacher’ and also by the participants in the group. At the end of the activities, there was discussion in small group, in order to identify and assess the feedback strategies that were helpful in the progression of the activity. There was also a global group discussion on the competencies revealed by the observation techniques, and on their efficiency.

In the first session, we started by proposing and discussing workshop guidelines, and brainstorming participants’ expectancies and beliefs about teacher feedback and about their participation in the workshop. This helped to promote an environment that was facilitative and trusting. We introduced theoretical background on the concepts of different types of feedback and their consequences, as well as the related concepts of student identity, student engagement, and academic trajectories. Participants were told that a web platform for the workshop had been prepared, where they could find literature texts, description of sessions and other relevant information. In addition, the platform would provide interactive support to participants in their autonomous work which, for this session, involved participants’ examination of some relevant literature as well as reports that presented indicators of good feedback practice. Documentation was provided to the participants to be analyzed as autonomous work, along with questions to be answered in writing.

The second session was a consolidation session, starting with a debate on the texts provided and on the answers written by participants as their autonomous work. A preliminary version of an observation grid was offered to the participants to be analyzed, discussed and adapted in small groups, and then in the whole group. Debate ensued as to the facilitative conditions for the use of feedback. (Table 1 shows the items of the resulting observation grid). The facilitator guided a global group activity in which she modeled the use of feedback. Three groups of teachers participated as 'students' in a learning activity which asked them for predictions and interpretations related to hands-on observations of discrepant events. The answers were probed by additional questions, or confronted by visual disconfirming feedback, leading to reflective answering and questioning, sometimes complemented by new hands-on endeavours. There were three volunteer observers seated at a fourth table, who observed the teacher's use of feedback, reflecting upon it, and commenting at the end.

As an example of session procedures and of the type of feedback that was modelled, we provide a more detailed description of this activity:

The facilitator requested three volunteer feedback observers, then told the story of a farmer who maintained a fenced-in vegetable garden on a larger property where animals were kept. The whiteboard represented the property and a house was also drawn on the board. The facilitator used a length of string, tied in a loop, and held it open in a rectangle against the whiteboard to represent the fenced-in vegetable garden. She described how the farmer kept the garden one year in a certain location, but now wanted to move the garden closer to the farmhouse. Being frugal, the farmer wishes to use the same fencing material. The facilitator shows the new position of the garden with the string at the marking board. Because of the position of the house, and the quality of the soil, the new rectangle is longer and narrower than the original. So, the facilitator asks, other things being equal, will the farmer have more crops now, less or the same? Two participants say there will be more crops (heads of lettuce).

F: Who thinks the farmer will have the same number of heads of lettuce?
[8 participant teachers said there would be the same number]
F: Who thinks the farmer will have fewer heads of lettuce?
[No one answered; two participants said they did not know])
F: Now I would like for you who answered "more lettuce" to explain your reasoning, why will there be more lettuces this year in the garden?
T1: Because the garden has a greater area in the second year.
F: How about you who answered "the same number". What is your reasoning?
T2: The garden has the same area as before.
[At this moment several of the other teachers adhere to this idea that the area must be the same, so the number of heads of lettuce will also be the same]
F: OK, You say we have the same area. What about now?
[Facilitator forms an even more narrow rectangle for the garden with the string]
Teachers: Yes, it is always the same area.
[Facilitator forms an even more narrow rectangle for the garden with the string]
Teachers: It has to always be the same area.
[Facilitator reshapes the string so that the sides are almost touching; some participants object, some are perplexed.

Facilitator then projects a grid onto the whiteboard and places the string loop upon it in the shape of a square. The string has 10 grid units on each side.]
F: So, with the help of an overhead transparency, what is the area of the garden if it is configured as a square?
Teachers: Um!!?!!.....ten times ten….? 100.
[Facilitator changes the configuration to a rectangle 4 by 16 grid units]
F: How about now?
Some Teachers: But it has to be the same. [Some teachers were silent, perplexed]
F: Is it the same area?
[Silence. The Facilitator continues to reconfigure the "garden" in ever smaller areas]
Teachers: OK. The area is smaller. But it is hard to believe.
F: So, what is the quantity that is constant here?
Teachers: Perimeter, not area.
F: Now , what were the objectives of this activity?
Some teachers: To understand the concept of area.
Other teachers: To observe the feedback strategies used by the teacher.
F: Very well, it taught content. And it showed how feedback can be used. Now, which strategies from the Feedback observation grid did I use? Can the observers, please, tell us about that?
[With the exception of *focus*, the teachers identified all categories in the observation grid as having been used. After short discussion, the teachers confirmed that *focus* was used throughout the exercise. Teachers mentioned also they had felt some difficulty with the observation task, because of the novelty of the grid and the large number of feedback moments presented by the "teacher"]

The session ended with an analysis of what their follow-up application work was. It was interesting to notice that participants did request, at this point, that the application included their observation of colleagues and being observed by them.

Following this same general model, in the four following sessions, through practical activities within specific session topics, participants experienced feedback strategies, first as 'students', and then applied them, as 'teachers', and finally reflected upon them and their effects. In their autonomous work, teachers designed, developed and implemented adequate feedback strategies to promote student learning in their specific curriculum areas and wrote reports on the application and its effects. Workshop educators assisted the participants in analyzing feedback used in the teachers' classes, and helped them in developing research skills on their teaching practices (including self- and hetero-evaluation of their beliefs, ways of thinking and processes implemented) in order to improve practice and reflection. Through this process, teachers resolved some of the problems that arose during teaching practice and also designed sharable curricular products and activities. The next-to-the-last session asked participants to share with the group a personal view on their involvement with the use of feedback and thoughts about their students' reactions to this particular teaching strategy. The autonomous task was for each teacher to interview two of their students in search of perceived effects of their teacher's new use of feedback in the classroom. The last session included a global reflection about participants' involvement and perceived learning, accomplishments and setbacks, their frustrations or motivations, and also included an evaluation of the workshop itself. Participants were also requested to fill in two workshop evaluation questionnaires, asking about workshop relevance and applicability, about how well it fulfilled their expectancies, and how it could be improved in

future versions. The workshop coordinators also inquired about the teachers' interest in continuing collaborative work.

Observation Instruments

The teacher development model used assumes the importance of teacher reflection on classroom practice. The theoretical framework provides specific areas for reflection. In order to promote and facilitate such reflection, an observational grid for the identification and analysis of feedback was elaborated by the educators based on Hattie (2009), Black and William (1998), Wiggins (2012) and, more explicitly, on the feedback strategies and content areas identified by Brookhart (2008). The grid included the four *Strategies* and five *Content* areas, and was used flexibly (different adaptations were prepared according to the nature of the session topics) both in in-session group work and in autonomous work. (Table 1 includes the seven categories most frequently used by the teachers in their reports and also a brief description of each category).

Two other observational grids were adapted to the work to be performed in two specific sessions, one aimed at analyzing teacher non-verbal feedback, and another was meant to be used in the session on problem solving. The first one focused on teacher non-verbal attending skills, specifically on how the teacher was responding to students through visual contact, posture, interpersonal distance, barriers, and equality of status. The second grid integrated an alternative classification of verbal feedback dimensions. It considered five dimensions: timing (same meaning as in Table 1); likelihood of feedback being used (feedback is concrete, understandable, actionable); tangibility and transparency (feedback was given on topics directly relevant to the activity, was enough for the student to continue without teacher's help, and promoted understanding of connections between ideas); goal-referenced (compares performance with goals, provides alternatives to attain the goals); consistency (describes what was done and suggests ways to improve).

Autonomous Work Assignments

Following group activities and discussion, the autonomous work was introduced—the application to the classroom of what was learned in each of the sessions. Participants were requested to develop feedback strategies for their academic areas, to implement the strategies in their classrooms and to analyze their feedback practices. Before the subsequent workshop session, teachers provided a written report on their self- and hetero-reflections about these practices. Whenever participants made remarks, comments or questions about the autonomous work, some time was allowed for the discussion of the issues. In the previous to the last session, the autonomous work had a different nature: teachers were asked to interview two of their students in order to examine pupils' views about any possible changes detected in classroom activities, in the way the teacher communicated with them, and also to understand student reactions to these changes.

Final Report and Self-analysis

At the end of the academic year, in accordance with what had been presented in the first sessions of the workshop, participants were asked to write a final report about their development and implementation of constructive feedback strategies. In the report they were requested to identify their major challenges and difficulties in transferring the knowledge to their classrooms and the solutions found in order to overcome those difficulties. The final report also requested teachers to perform self-evaluation of the work they developed throughout the eight-month workshop including a description of any impact detected on the part of their students.

Evaluation of the Workshop

In their written reports on the autonomous work, which constituted one of the evaluation dimensions for the participants and also for the workshop itself, teachers described and analyzed their classroom implementation in reference to the observational grids developed and used.

At the beginning of the workshop, the participants unanimously objected to the possibility of peer observation in their classrooms. As an alternative they proposed self-observation. However, they reversed themselves in the second session, asserting that peer observation would be a better approach. One interpretation of this opinion change is that it resulted from a dynamic process: having observed feedback given by the workshop facilitators, the participants (a) had greater confidence in acting as observers; (b) saw the practical utility of peer observation; and (c) developed the belief that being observed was not threatening.

In Table 1 we present the observational grid generally used by the teachers. This table includes the seven categories most typically analyzed by the teachers in their reports, as well as a brief description of each one. It is not our intention here to quantify or prioritize the categories. Such a hierarchy would have little meaning given the diverse subject areas of the teachers and the unknown detailed nature of the specific classroom activities that gave rise to the identification of specific categories.

Strategies	Description
Timing	-Provides immediate feedback or slightly delayed feedback, for student comprehension
Mode	-Selects the best mode for the message (oral, written, visual, kinaesthetic) -Interactive feedback
Audience	-Feedback is individual; or feedback is given in group
Content	
Focus	-On the work; on the process the student used -On the student's self-regulation
Tone	-Choose words that communicate respect and position the student as the agent -Choose words or attitudes that cause students to think / asks for elaboration
Function and Valence	-Is descriptive, do not judge -Accompany negative descriptions of the work with positive suggestions for improvement
Clarity and Specificity	-Use vocabulary and concepts the student will understand -Tailor the degree of specificity to the student and the task

Table 1: Feedback Strategies and Content

Workshop evaluation was performed based on the following information sources: (a) written reports on the autonomous work associated with each of the sessions; (b) a final written report; (c) oral reflections, especially during the last two sessions; and (d) answers to two questionnaires completed in the last session (one from the Portuguese Scientific-Pedagogic Council of Continuing Education, and one elaborated by the workshop coordinators to examine teacher perspectives on their participation, on the workshop itself and on possible future collaboration with the coordinators). Oral reflections and answers to the questionnaires will be analyzed in the Discussion section.

In the written reflections of monthly autonomous work reports, teachers described their use of feedback strategies and how they perceived its importance. In the final written reports, teachers commented that, through their participation in the workshop, they developed not only teaching feedback competencies but also positive feelings toward the use of these communication strategies to improve involvement, motivation, and self-regulation and thinking skills of their students. From the two sources of information on the workshop evaluation, we identified five emergent themes: (a) effects of feedback strategies on the teachers (including knowledge and skills, practice, attitudes and appreciation of opportunities); (b) effects on the students (including content understanding, engagement, self-regulation and performance); (c) effects on classroom environment; (d) the nature of feedback; and (e) difficulties encountered in the application of feedback strategies.

Below we provide excerpts of teacher comments that illustrate the above themes. All twelve teachers are represented at least once. When appropriate, the classification, according to the Table 1 categories, accompanies the comment.

Effects of Workshop on Teachers

Improvement of Participants' Knowledge and Skills about Feedback Strategies

Comments show that most teachers felt the workshop had been important for them, in improving their knowledge and skills on feedback strategies:

> *(…) I used feedback strategies before, but in a manner that was less careful, systematic and intentional, and I did not reflect much on them and their effects on students (…)*
> *(…) Using immediate feedback in cases of wrong answers and delayed feedback for process competencies will result in student motivation and involvement (…) [Timing]*

> *(…) Many students become unmotivated because their teachers are not able to meet their learning needs. Each student is an individual and teachers have to be attentive to each student, responding through strategies such as individual feedback...The way we used to give feedback was not the most adequate (...)[Audience]*

> *(…) The workshop confirmed its importance by increasing our knowledge on feedback strategies and promoting knowledge-sharing among colleagues. These are of great importance for me as a teacher and for the school in general, since the use of feedback helped us to reflect upon our practices and, collaboratively, develop our own self-regulation of learning. As a result of the workshop, we have changed both class planning and activities (…)*

Participants' Change in their Teaching Practice

The data showed that the workshop helped teachers to be more attentive to the unique characteristics of each individual student and to the learning context in which he/she is integrated. This helped teachers in their practice:

> *(…) One student told me, in my English class, that he was not able to write in English. I asked him why that would be. The student thought about his difficulties and identified the weak vocabulary and trouble in conjugating the verbs (…) [Tone]*

> *(…) As I noticed an alternative conception in the student argumentation, I confronted the arguments with counter-examples in order to conduct the student to more rigorous and scientific conceptions (…) [Function and Valence]*

> *(…) Feedback allows me to improve my teaching since it helps me understand student difficulties. And when I see how students react, I am able to change the way I talk and interact with them (...)[Mode]*

> *(…) This training on the communication of feedback in the classroom was extremely useful for my future practice, since it allowed me to recognize types and contents of feedback and its importance in the students' academic trajectories. I believe that the knowledge I've gained in this training program is important in terms of my professional performance since it enables me to recognize ways of acting that will help the student in learning how to learn, contributing to his success (…)*

Improvement of Participants' Attitudes toward Feedback Strategies

The workshop promoted a growing awareness of the usefulness of feedback strategies, specifically the benefits of using descriptive feedback about student performance as opposed to using judgemental feedback. Teachers noticed a reduction in their use of judgemental feedback:

> *(…) I did not judge negatively the student's ideas…and the result was positive (…) [Function and Valence]*

The workshop promoted a belief that feedback practices can have a positive impact on student performance and self-regulated learning, as the literature predicts:

> *(…) I used oral feedback in group-work situations and written feedback for written individual work. This seems to function well in terms of helping students to reflect about their work (…) [Mode]*

Participants developed positive feelings toward their involvement and use of feedback strategies as an instrument to improve students' involvement, motivation and self-regulation skills:

> *(…) The oral feedback I gave was always interactive—the students and I talked about their work and how I could help them to 'uncover' their competencies (…) [Mode]*

> *(...) I recognize now that I generally only pay attention to students when they have weak performance or when they have disciplinary problems...We, teachers, have to change this situation and value what the student does, the small steps they take, and their efforts–only in this way can we increase their motivation and self-confidence. We have to promote interactivity in class, since students understand better when they hear from colleagues. Due to "covering the syllabus", we generally do not give the students time to think or we provide them with the answers to our own questions. It is very important to provide useful feedback, as for now the students complain often that we only say to them "you have to work harder!" or "you have to pay more attention to what is asked from you"(…)*

> *(…) This training allowed me to become aware of some practices, in terms of feedback, that I already use over the years, some being positive and others that must be put aside. I realize that this training, just by itself, doesn't eliminate, by magic, less positive aspects of this practice, but it contributed to a closer look at them (…)*

Participants' Appreciation of Opportunities Provided by Workshop

In the beginning of the workshop there was unanimous resistance toward classroom observation among the teachers; during the workshop participants changed their attitude toward being observed and observing colleagues. Some teachers refer to this specific aspect, some others just appreciate opportunities provided in general:

> *(…) It was very useful to work in teams and to observe colleagues and being observed by them. Equally useful was having the possibility to reflect collaboratively on our competencies in the use of feedback (…)*
> *(…) In a profession where communication plays such an important role, developing and refining the type of response (feedback) is key to improving the quality of education. I'm also more aware of some details than I was in the beginning of the workshop, which is positive in understanding and improving my approach to students in the classroom (…)*

> *(…) I acquired tools that will facilitate my approach to students and curricular subjects; became more sensitized to the ways of acting in order to motivate and guide students through the use of various types of feedback. I have reflected on the impact that my verbal and nonverbal attitudes can have on students (…)*

Effects of Workshop on the Participants' Students

Some of the teachers' comments focused on the students' reactions to their use of feedback strategies, namely student content understanding, involvement and self-regulation:

Content Understanding

> *(…) During the Physics and Chemistry class, I used simplified vocabulary for better student comprehension of concepts and only later did I introduce the scientific terminology, and this seemed to work for them (…) [Clarity and Specificity]*

Involvement and Participation

> *(...) when I interviewed the students, what surprised me was the fact that, for these students, the most important feedback is showing them*

that I believe they are capable of succeeding («...you say everybody can make it, and this is a good method because it leads us to believe we can make it...»). Teachers' beliefs are very influential for students' self-expectancies, i. e., student engagement and trajectories can be drawn, positively or negatively, from the attitude of the teacher towards his/her students, namely that which is shown through teacher's feedback (...) [Tone]

Self-Regulation Competencies and Performance

(…) I aimed at guiding students for their self-regulation, making them understand they are the agents of their own learning. Students were encouraged to think and reflect upon, and assess, their own learning (…) [Focus]

Effects of Workshop on Classroom Environment

The data indicated that feedback about student performance assisted the quality and tone of the relationship between teacher and students:

(…) Using feedback is important also because it generates feedback on the part of students which can help us, teachers, to rethink our teaching strategies (…) [Tone]

(…) Non-verbal feedback is important not only to attend students in their cognitive learnings, but also in their attitudinal learnings. For instance, when they display disruptive behavior, non-verbal feedback can be very useful (…) [Tone] [Timing] [Mode]

Nature of Feedback–Four Levels

The data are consistent with the contention in the literature that feedback can be directed to different levels (task, process, self-regulation, and self). Teachers affirm the need to direct feedback to the three first levels.

(…) In my class about cultural differences, faced with xenophobic attitudes of some students, I confronted these attitudes and involved all students in an activity in which they had to role-play the discriminatory situation, so helping them to improve their citizenship competencies (…) [Focus]

(…) when I returned the tests, I gave each student his/her own test, informing them of the score for each question. I asked them to identify

the mistakes they had made in each question based on the score they had earned (…) [Tone] [Focus]

(…) One of the students I interviewed said that, in spite of having help from his mother and his friends, the most significant help along the year came from the teacher who gives remediation classes. This teacher gave him immediate feedback on the task he was doing which, he said, is always more understandable (...) [Focus] [Timing]

Difficulties in using Feedback Strategies

Some teachers displayed some frustration due to time constraints and limitations imposed by inadequate teaching conditions, or even by recognizing their own previous imperfection in teaching:

(…) using individual feedback for students working in groups, I became aware that it is an efficient form of feedback for the students attended to, although it gives me some frustration that I am not able to attend all the students in need of help at a particular moment (…) [Audience]

(…) I am very demanding with my students with respect to their behaviors in class. This is a characteristic that does not facilitate student involvement and participation... I do not plan many group work activities because students have those behavioral problems...and the students sometimes do not feel comfortable when I sit at their table to help them through feedback strategies...Using more written feedback is also a challenge for me.....but although it requires spending more time, I believe it will help me in my teaching (...)[Audience] [Mode] [Focus]

(…) In spite of seeing the positive effects of feedback, sometimes it is hard to attend to all the students that need help. I am not able to hide the fatigue that giving feedback to so many students promotes nor my frustration for not being able to help all of them at the moment they need it....maybe more group activities would help (...)[Focus] [Timing] [Audience]

(…) This workshop helped me to reflect and decide that the feedback I was using in my classes was not always helping students to reduce the gap between where they were and where they should be in their learning. Often my feedback was not facilitative in relation to student difficulties, sometimes because the language was not the most adequate, or because the feedback was not specific enough. Also, I started noticing that I seldom looked for students' feedback on the content of the discipline, which prevented me from knowing if it had been understood or not(...)[Clarity and Specificity][Tone]][Timing]][Focus]

Discussion and Conclusions

Teachers play a key role in student engagement with the school and in the construction of student academic trajectories (Carvalho et al., 2011; Conboy & Fonseca, 2009; Fonseca et al., 2011; Fonseca & Conboy, 2006; Schussler, 2009; Veiga, 2009). One important aspect of the teacher's role in the classroom is to relate to their students through the use of feedback (Black & Wiliam, 1998; Black et al., 2002; Ponte, Paek, Braun & Powers, 2009). Different authors have identified aspects of the association between the nature of teachers' feedback and students' engagement and performance (Hattie, 2009). Specific teacher education that emphasizes this central issue is necessary in order to assure that feedback strategies are used in classrooms in an appropriate and efficient way.

Teacher education programs should focus on teacher competencies in developing and implementing classroom activities and strategies that aim at promoting a thoughtful relation between the teacher and his students, namely through the use of feedback. Teachers must strive to motivate their students to be reflective, to be focused and to explore their own understandings (Brookhart, 2008; Carvalho & Solomon, 2012), and teacher education should provide teachers with guidance and help in doing so.

In order to influence student learning, teachers need to make a distinction between what is unique in a certain student and context and what is generalisable to other contexts and students (Opfer & Pedder, 2011). As such, it is important that before adopting a certain feedback strategy, factors such as the student characteristics, the assignment, and classroom atmosphere must be taken into account by the teacher; there is no single solution for all students, all of the time.

Data from different sources in our study showed an improvement in the participants' knowledge and skills about, and attitudes towards, feedback strategies. Several of the participant teachers also reported having observed greater involvement, active participation and better content understanding on the part of their students as a result of the careful and systematic use of feedback. This outcome supports such claims made in the literature (Carvalho et al., 2011; Conboy & Fonseca, 2009; Fonseca & Conboy, 2006; Fredricks et al., 2004; Kluger & Denisi, 1998; Salema, 2005; Schussler, 2009; Valente, 1997; Verkuyten & Thijs, 2009; Zimmerman & Schunk, 2007).

Data from our study also support the idea affirmed by several authors that feedback is best conceived as existing in different dimensions, such as the cognitive, the affective and the motivational (Brookhart, 2008; Dweck, 2006; Hattie, 2009; Hattie & Timperlay, 2007). In the same way, our results were consistent with the literature in terms of the effects on self-regulation and performance of the student as a receptor agent (Kluger & Denisi, 1996, 1998; Salema, 2005; Valente, 1997; Zimmerman & Schunk, 2001, 2007). Our intervention did not allow us to infer conclusions on the effects of feedback on student identity nor on their long-term academic trajectories. Future studies may wish to explore these questions within more student-centred, longitudinal designs.

As one useful instrument of analysis and description of the use of feedback, both in terms of strategies and content, teachers used the observation grid they had helped to prepare (Table 1). In preparing this grid, it was not our intention to quantify or compare the categories in terms of their importance. Such analysis could be misleading in the current study in which participants came from a variety of disciplines. The intention was only to assist teachers and workshop facilitators to describe feedback and foment reflection. In this role, the observation grid was successful as measured by participant comments. Future studies may explore the relative

frequencies of observed strategies and content in specific contexts (for example in science, mathematics, language classrooms) in order to develop normative profiles of feedback use.

In addition to the seven categories used on the observation grid, Brookhart (2008) also suggested amount of feedback as a strategy, and comparison as a content (norm-, criterion-, or self-reference). Our experience in the workshop led us to eliminate these two categories since they were essentially unused by participants. In addition, Brookhart originally proposed function and valence as distinct categories. Workshop experience led us to collapse them into a single category. Future researchers may wish to re-introduce, and expand, these categories in order to assess their roles in other contexts.

Monthly autonomous work reports show that the seven categories were used by the participants to describe observed feedback. Several response themes emerged from the analysis of participants' comments including some difficulties they encountered. Comments indicate a growing awareness on the part of participants of the usefulness of feedback. Participants were, however, realistic in their judgements. As one said, it was frustrating to know that there were students who needed more feedback, but there was neither time nor proper conditions to address all students about all topics. Analysis of the reports lead also to the belief that there was a growing awareness of the benefits of using descriptive feedback about student performance as opposed to using judgmental feedback. Such views are seen as leading to efficacious feedback and are consistent with the theoretical preferences espoused by several authors (Black & Wiliam, 1998; Garbett, 2011; Hattie, 2009; Ponte et al., 2009; Valente et al., 2009). Content of the participant reports also reflected a belief that feedback practices could have a positive impact on student performance and self-regulated learning as previously predicted (Kluger & DeNisi, 1996, 1998; Ponte et al., 2009; Salema ,2005; Valente, 1997; Zimmerman & Schunk, 2001, 2007).

Participants' comments indicated that feedback about student performance assisted the quality and tone of relationships between teachers and students. These observations are consistent with theoretical predictions (Black & Wiliam, 1998; Black et al., 2002). In addition, participant teachers viewed their students as more engaged in classroom participation (Carvalho et al., 2011; Fonseca et al., 2011; Fredricks et al. 2004; Schussler, 2009; Veiga, 2009; Verkuyten & Thijs, 2009).

Hattie's (2009) contention that feedback can be directed to different levels (the task, the processing of the task, self-regulation and the self) was supported by the participants' comments, especially within the content category focus. We note in the reports a growing awareness that strategies adopted by teachers to reduce discrepancies needed to be adjusted to the level at which the feedback takes place.

In the final session of the workshop, in a general debate, and in their answers to two questionnaires, as well as in their final written reports, teachers showed their appreciation for having had the opportunity to work in teams and to observe colleagues and be observed by them. They also valued the possibility of reflecting collaboratively on their competencies in the use of feedback strategies. It is noteworthy that, at the beginning of the workshop, there was unanimous resistance to a proposal for outsider observation of classes. Thus, the debate and answers to the questionnaires confirmed a substantial teacher attitude change toward having observers of their performance in their classrooms.

Some participants also indicated that they already used feedback strategies before the workshop, but in a much less careful, systematic and intentional way, and recognized that they had improved both the frequency and the quality of their use of feedback strategies. According to these participants, they also did not reflect much on their feedback strategies before the

workshop participation. In general terms, some of the answers in the questionnaires show that, through participation in the workshop, teachers developed not only skills but also positive feelings toward the use of feedback strategies as an instrument to improve students' involvement, motivation, and self-regulation skills.

According to some other participants, the workshop helped them to be more attentive to the unique characteristics of each individual student and to the learning context in which he/she was integrated, this way helping them to adopt adequate feedback strategies for each student, as suggested by Opfer and Peddler (2011).

During the global reflection, the educators who were responsible for this session–the workshop coordinators– asked the participants about which aspects of the workshop could be improved. Teachers generally agreed that the autonomous work required of them between the group sessions was too much for the time they had at their disposal among their numerous school responsibilities. Some of them indicated that the in-class sessions could have been more practical, with more examples of the concepts and with more sharing of experiences and difficulties related to the autonomous work. These answers were consistent with the answers provided in one of the questionnaires.

When asked about their interest and availability to collaborate with educators/facilitators in the next school year in applying and assessing effects of feedback on students, 50% of the participants said they would do it if conditions in school would allow. This was confirmed through the written responses to one of the questionnaires.

Considering the comments and suggestions made by our participant teachers, we suggest that future teacher education activities related to feedback strategies in the classroom should always seek articulation among all the training sessions and balance between the theoretical and practical approaches. Specifically, in each session there should be expanded discussion about the preceding autonomous work. Also, teachers must, more systematically, be allowed and requested to work collaboratively in the development, implementation and analysis of their classroom activities. A more ample use of practical examples and simulations of real classroom situations improves a teacher's knowledge about the most useful feedback strategy for each student, assignment and classroom atmosphere. In planning future training, one needs also to keep in mind that while the autonomous work requested should encourage participants to research and reflect deeply on their feedback practices, it is also important that this work fit well in the already very busy work schedule of the participant teachers.

Research studies on characteristics of a teacher education program that promote efficient feedback strategies in the classroom are scarce, and, in accord with Hattie (2009), we suggest that future research should emphasize this important area of study.

The scientific literature has established a number of principles that are useful in describing educational contexts and outcomes, namely the association between the nature of teachers' feedback and students' school commitment and performance. In fact, the literature indicates that feedback strategies are a relevant factor in promoting the relation between teachers and their students, as well as enhancing student involvement, performance and self-regulation (Black et al., 2002; Black &Wiliam, 1998; Hattie, 2009; Ponte et al., 2009). Further teacher education is necessary in order to encourage and enable the implementation of appropriate feedback strategies.

Based on observation and teacher reports, this workshop for teachers, with specific objectives, characterized by integration of theory and practice, distributed along an extended period of time (one school year), and focused on application and collaborative reflection by peers

and facilitators did result in change of (a) teachers' use of feedback in the classroom, and (b) student involvement and motivation. Participation in the sessions and the follow-up classroom application enhanced teacher involvement, knowledge and competencies in the use of feedback strategies, and their positive feelings toward this use aimed at improving involvement and thinking skills of their students. Participating teachers indicated growing awareness of the usefulness of feedback, specifically a belief that good feedback practices could have a positive impact on student performance and self-regulated learning. They viewed their students as more engaged and perceived an improvement in relationships between teachers and students. They noted a reduction in their own use of judgmental feedback that they saw as lacking utility and potentially harmful. The greatest difficulty they reported in implementing the recommended feedback practices—the eternal lament of teachers—was a lack of time and proper conditions to attend to all the needs of all the students.

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