Using formative assessment to influence self- and co-regulated learning: the role of

evaluative judgement

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Abstract

Recently, the concept of evaluative judgment has gained attention as a pedagogical approach to classroom formative assessment practices. Evaluative judgment is the capacity to be able to judge the work of oneself and that of others, which implies developing knowledge about one's own assessment capability. A focus on evaluative judgement helps us to better understand what is the influence of assessment practices in the regulation of learning. In this paper we link evaluative judgment to two self-regulated learning models (Zimmerman and Winne) and present a model on the effects on co-regulation of learning. The models help us to understand how students can be self-regulated through developing their evaluative judgment. The co-regulation model visualizes how the learner can become more strategic in this process through teacher and peer assessment in which assessment knowledge and regulation strategies are shared with the learner. The connections we make here are crucial to strengthening our understanding of the influence of assessment practices on students' learning.

Keywords: evaluative judgment; formative assessment; self-regulated learning; co-regulation; self-assessment; peer assessment.

Using formative assessment to influence self- and co-regulated learning: the role of evaluative judgement

Students and professionals need to be able to monitor and effectively update their learning for new and demanding tasks in the current fast-changing world scenario. Skills for planning and monitoring one's progress, often called self-regulated learning, are crucial for this process (de la Harpe & Radloff, 2000). Additionally, a key attribute of lifelong learners is to be able to evaluate their own performance and that of peers. This requires the student, not only to be able to judge the work of themselves and their peers, but also to develop knowledge about their own assessment capability (Absolum, Flockton, Hattie, Hipkins & Reid, 2009), also known as evaluative judgment (Tai, Ajjawi, Boud, Dawson & Panadero, 2018). Such requirements mean that, to develop evaluative judgment, active student involvement in assessment practices is crucial, as the literature on formative assessment has argued since its inception (Wiliam, 2011). However, more details about the relationship between these skills, i.e. evaluative judgment and self-regulated learning, are required if programs are to be designed effectively, especially on how assessment practices influence students' regulation of learning processes.

The last decade has seen an increase in the number of publications that explore the effects of different formative assessment practices on self-regulated learning (Allal, 2016; Panadero, Andrade & Brookhart, 2018). As concluded by authors (Panadero et al., 2018), the level of specificity in the description of the relationships in these publications has been augmented significantly since the late 80s, in part because both fields have developed enormously since then. For example, there is now empirical evidence of the influence of formative practices such as self-assessment and specific types of teachers' feedback on self-regulated learning (Brown & Harris, 2013; Hattie & Timperley, 2007; Panadero, Jonsson & Botella, 2017). Importantly, it has been identified that further research is needed in how

formative assessment practices effects on self-regulated learning (Panadero et al., 2018). Two aspects of this of importance here are (a) examining the effects of formative assessment practices on students' psychological processes, and (b) further clarifying the influence of formative assessment practices on co-regulation of learning (Allal, 2016), that is, the influence of regulation from other sources (e.g., teachers) on the development of students' own self-regulation.

The aim of this paper therefore is to explore the relationship between evaluative judgment, which develops through formative assessment practices, and self-regulated learning. To achieve this aim, we will anchor evaluative judgment to three different self-regulated learning models providing a level of detail in the relationships not seen previously. The paper is organised in six sections. First, we summarise the concept of evaluative judgment. Second, we connect evaluative judgment to formative assessment practices to help visualise the potential of evaluative judgment as a reference framework to anchor formative assessment. Third, we consider how formative assessment impacts on self-regulated learning. As evaluative judgment is a new concept, we build the connections based on the longer established concept, formative assessment. Fourth, we present the influence of evaluative judgment on two self-regulated learning models to explore the first above-mentioned needed area: connecting assessment practices to student's individual psychological processes. Fifth, we will explore the role of others through exerting their evaluative judgment, and the effects this has via co-regulation. And finally, we discuss the implications of our claims for teaching and learning practices.

Evaluative judgment

Here, we follow the definition of evaluative judgment as "the capability to make decisions about the quality of work of oneself and others" (Tai et al., 2018). Importantly, the development of evaluative judgment is a way of conceptualising and focusing on the

assessment capability of students as an important lifelong goal for all learning practices. In other words, learning how to assess and applying it to oneself becomes a central part of the curriculum. Developing evaluative judgment involves not just a set of pedagogic practices, but also the metacognitive activities and internal processes in which students engage. A metacognitive focus is needed because evaluative judgment requires the student to be able to reflect about a performance and, based in their mental schema, make a judgment about the quality of the work demonstrated in that performance.

As Dreyfus and Dreyfus (2014, p. 781) showed, the concept of expert evaluation can be traced back to Ancient Greece in some interesting reflections by Plato triggered by the observation of his teacher Socrates. Developing expert evaluative judgement, is therefore not a new idea; what is new is applying it to formal education settings. In more recent times, it has been taken up in Sadler's (1989) ideas of 'evaluative knowledge' (p 135), or 'evaluative expertise' (p 138).

Recently, the term evaluative judgment, has been gaining momentum in assessment literature as a way of consolidating a number of previously separate ideas and to provide a specific pedagogic focus on what is needed for students to build their own expertise in appraising work (for a fuller discussion, see Tai et al., 2018). Importantly, other authors have aimed for similar goals using terms like "assessment capable students" (Absolum et al., 2009; Booth, Dixon and Hill, 2016). Regardless of terminology, the educational aim remains the same: students should be able to appraise their own work. Another related concept is "evaluative thinking" which is a term that refers to the capacity for evaluation that is needed from professionals of the evaluation (e.g. educational evaluators, economics evaluators) to correctly do their job (Vo, Schreiber & Martin, 2018).

Importantly, making judgments about the quality of one's own or another's work requires an understanding of, at least, three evaluative judgment components -i.e. context,

quality and standards, and assessment criteria- and how they influence self-regulated learning in combination with expertise (Boud, Dawson, Tai & Ajjawi, 2018).

1. **Context**. Vital in evaluating any piece of work is understanding the performance and evaluation context in which it operates. Context refers to the adequacy of the performance relative to what is required, as well as the ability to "read" information about the context in order to deliver something with suitable characteristics. Understanding the context in which the judgment is to be formed is vital to evaluate someone's work.

2. **Quality and standards**. To accurately assess a task, it is crucial to understand what quality performance looks like. This is closely related to standards which represent a specific level of quality of an object. A standard provides the students with information about the level of excellence or quality of their performed work.

3. **Assessment criteria.** These are the specific assessment indicators to fulfil in order to reach a standard, where the latter is the underlying reason for the criterion. By understanding the quality features of a task (standards) those that are essential can be used as primary criteria to assess the task. They are also important to evaluative judgment because the assessor needs to focus attention on them and provide an evaluation on whether they have been met.

4. **Expertise**. For evaluative judgment development it is crucial to have expertise in performing the task to be able to understand and appreciate quality and interiorise the criteria, along with an adequate interpretation of the context and its demands (e.g. Nicol & McFarlane-Dick, 2007). Expertise is developed by deliberative practice, which means not only performing the task many different times, but most important to the development of evaluative judgment, the student needs to evaluate that task a number of times, to become an expert in making such judgments. Therefore, the focus

is on deliberative assessment practice. While expertise is not an evaluative judgment

component in itself, it is a necessary condition for its development. This component

describes an ongoing development of evaluative judgment that results in a more

accurate judgement of the first three components.

As will be shown later, these components are crucial to anchor evaluative judgment to self-regulated learning models. Evaluative judgment comprises many of the features of the learning aspects of self and peer assessment, plus a general understanding of what the making of judgments is about. The use of the discourse of evaluative judgment enables us to conceptualise student involvement in assessment as a fundamental learning outcome. Importantly, this skill is developed through formative assessment practices such as self and peer assessment because these can allow the student to reach a deeper knowledge about what, how and why to assess (Tai et al., 2018).

The articulation of formative assessment practices within evaluative judgment

Assessment is a crucial influence on learning in the classroom because it allows us to have access to indicators of students' learning and enables the instructional environment to be adapted in response to student achievements. As Wiliam (2011) writes in his historical review of the formative assessment field: "It is only through assessment that we can find out whether a particular sequence of instructional activities has resulted in the intended learning outcomes" (p. 3). Similarly, it enables students to track their performance, determine whether they are prepared for summative judgments and receive helpful information to assist them in so doing. Emphasis on formative assessment has increased in recent years as it focuses on promoting student learning instead of merely judging levels of performance. This is achieved mainly in two ways: through teachers providing assessment and feedback of students' work,

and through student involvement in assessment in a variety of ways. Regarding the former, there is considerable literature on formative assessment and feedback that points to the importance of what teachers do. For example, teachers should focus on aspects of students' work that they have the opportunity to improve; comments should be timely, should focus on processes rather than correctness of performance, and should emphasise students' ability to make judgments of their work rather than merely on the work itself (Boud & Molloy, 2013; Hattie & Timperley, 2007; Shute, 2008). Formative assessment is needed to assist students to develop their capacities for evaluative judgment through helping them to calibrate and refine their own judgments through inputs from others.

Regarding the latter, student involvement in assessment can take many forms. At the simplest level, students identify essential components of the feedback and take action on them. A greater level of involvement, on the other hand, may include self- and peer-assessment. The self-assessment literature has been preoccupied by studies of self-marking, especially the accuracy of self-grading when compared to the teacher's (e.g. Boud & Falchikov, 1989), which is of less interest in the context of improvement. However, there is a growing and, by now, well-established interest in the broader notion of self-assessment and its effects on learning (Boud, 1995; Andrade & Brown, 2016). A meta-analysis has found the median effect of self-assessment on achievement to be have an effect size of 0.40-0.45 (Brown & Harris, 2013). Peer assessment has a similar trajectory with an earlier line of research on peer-grading accuracy (Topping, 2003) and a growing interest on peer assessment effects on learning, increasingly frequently known as peer feedback (Sluijsmans, 2002; Topping, 2009; van Zundert, 2012). Just as with self-assessment we focus not on the production of a grade but student engagement with standards and criteria, the formation of judgements and the generation of rich feedback information based on evidence.

In sum, it is through formative assessment practices that students can obtain guided understanding and deeper insights about their evaluative judgment. When teachers implement activities such as identifying what constitutes good work and students giving and receiving feedback, which involve them in assessment, students activate their knowledge about the assessment context, quality and standards, criteria and expertise in the task, and express it to provide an accurate assessment. In other words, to exert and train their evaluative judgment.

As the influence of formative assessment practices on self-regulated learning has been well studied, this provides an entry point into exploring links between evaluative judgment and self-regulated learning.

Self-regulated and co-regulated learning concepts and the influence of formative assessment

Self-regulated learning conceptualises the mental, emotional and motivational processes that learners go through when striving for an outcome. In a more scholarly definition self-regulated learning "*refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals*" (Zimmerman, 2000 p.14). In other words, self-regulated learning provides a framework that explains students' actions and processes—i.e. (meta)cognitive, behavioural, motivational and emotional—, whether conscious (e.g. explicit enactment of a specific learning strategy such as creating a concept map) or unconscious (e.g. emotional reaction to receiving negative feedback), that they experience while performing academic tasks (Panadero, 2017; Greene, 2018). Because of the apparent fruitfulness of this perspective, it has become a major educational goal to promote students' self-regulated learning via formal education at all levels (e.g. Dignath & Büttner, 2008).

Importantly, the use of interventions based on self-regulated learning has shown in meta-analyses to positively impact students' achievement (e.g. Broadbent & Poon, 2015; Richardson, Abraham, & Bond, 2012). As argued by Sitzmann and Ely (2011) in their meta-analysis of higher education students and workers: "…most of the self-regulatory processes exhibited positive relationships with learning, goal level, persistence, effort, and self-efficacy having the strongest effects" (p. 438). Therefore, what makes self-regulated learning a powerful framework is the combination of different strategies that promote learning.

One focus of formative assessment since its inception is on the development of learning strategies (e.g. Black & Wiliam, 1998). Significant achievement in the last two decades have been made formulating theoretical connections between formative assessment practices and their effect on students' activation of learning strategies, that is, self-regulated learning- (e.g. Allal, 2016; Nicol & McFarlane-Dick, 2006; Perrenoud, 1998). In the last five years empirical evidence of this relationship has been found, especially between self-assessment used with formative assessment purposes and their effects on student self-regulation (Panadero et al., 2018).

A number of claims have been made and tested regarding self-assessment and self-regulated learning. Panadero and Alonso-Tapia (2013) argued that formative assessment and self-regulated learning are addressing the same phenomena, self-assessment, from different perspectives. Formative assessment has typically been directed to pedagogical and instructional issues, while self-regulated learning has focused on internal processes such as cognitive and emotional ones. They argued that linking them together would enrich our understanding and, following this logic, they established some links between formative assessment practices and Zimmerman's (2000) and Winne's (1996) self-regulated learning models; something that Nicol and McFarlane-Dick (2006) also did with Winne's model. We aim to develop these links further by providing more specificity to the connections below. To

be able to self-assess is a crucial self-regulated learning skill, and as discussed earlier requires evaluative judgment. As Paris and Paris (2001) write: "Self-assessment includes all three domains of self-regulated learning: cognitive, motivational, and affective" (p. 95). As argued by Andrade (2010, 2018), students themselves are the definitive source of formative assessment as it is through their own assessment that they can regulate their actions. Finally, a recent meta-analysis gives strength to the influence of self-assessment interventions on self-regulated learning with effects sizes of 0.23, 0.65, and 0.43 on three different measures of self-regulated learning and also an effect of self-assessment of 0.73 on self-efficacy, a crucial self-regulatory process (Panadero, Jonsson & Botella, 2017).

When considering the regulation of learning, there is more to it than just the "self". For the development of self-regulated learning the presence of the "others" is crucial. Through interaction, others help the student in his or her zone of proximal development, not only to perform the task but also to learn how to regulate his or her actions (McCaslin & Hickey, 2001). This concept is known as co-regulation. An example would be a student interacting with a person who has a more expert role (teacher or more knowledgeable peer), who teaches the student how to write an excellent summary. In the process of doing so, the expert shows the student not only how to write the summary, but also aspects as clarifying and establishing goals, monitoring their progress, etc. When that happens, co-regulation is occurring. Further, if the expert peer is for example using an assessment rubric to help the student better understand the criteria and standards, then co-regulation is happening in direct connection with the student's development of evaluative judgment. In other words, developing evaluative judgment becomes the content of the instruction.

To date, there is not enough empirical evidence to support the connections between teacher assessment practices and co-regulation. However, these ideas have been theoretically discussed by proposing the co-regulation of learners via classroom assessment (Allal, 2010;

2016) and teacher and peer assessment (Andrade & Brookhart, 2016). Further, two empirical reviews (Hattie & Timperley, 2007; Shute, 2008) found an indirect connection between teachers' feedback characteristics and co-regulation. Hattie and Timperley (2007) in their review concluded that feedback aimed at the self-regulation level helped students' performance, although the authors did not report any study exploring if that type of feedback does actually have an impact on students' self-regulation. The same results were found when it comes to peer assessment effects on co-regulation: while there is no empirical evidence showing a direct connection, there are strong theoretical arguments for the claim (Panadero, Jonsson & Strijbos, 2016; Reinholz, 2016). It is crucial then that we have a clear understanding of how a student's evaluative judgment and the regulation of learning is influenced by teachers and peers during the assessment process.

As mentioned previously, our aim is analysing how students' evaluative judgment effects self-regulated learning, at a personal level, and co-regulation, at an interactional level via teacher and peer assessment. As has been argued elsewhere, formative uses of teacher, peer and self-assessment come together as elements of what is needed to develop students' evaluative judgment (Tai et al., 2018). More importantly, evaluative judgment allows us to refocus our understanding of how assessment practices influence the regulation of learning. However, we do not know yet how evaluative judgment influences these processes and what features of evaluative judgment activities are the most important for this end. An exploration of the conceptual connections between evaluative judgment and self-regulated learning are a necessary first step in this process.

Connecting evaluative judgments and self-regulated learning models: A closer look at what happens at the individual level

There have been previous attempts to connect formative assessment, especially peer- and self-assessment and their impact on self-regulated learning (for a review Panadero et al., 2018). Nevertheless, Nicol and McFarlane-Dick (2006) are the only authors to our knowledge who presented a specific self-regulated learning model (Winne's) in relationship with how assessment practices influence the regulatory processes. However, more detail on these connections is needed, as these are crucial for teachers to know how to construct effective learning environments around their assessment practices. Additionally, researchers need more detail about the connections to be able to design more specific and fine-grain studies.

We analyse here the effects of evaluative judgment in two self-regulated learning models. First, we discuss Zimmerman's (2000) model which is a balanced representation of cognitive, motivational and emotional self-regulated learning processes, providing a comprehensive picture of the effects of evaluative judgment on them. Secondly, we consider Winne's (1996, 2011) model because it offers a more specific and rich treatment of cognitive and metacognitive self-regulated learning processes. Using Winne's model, we visualise a more detailed map of the self-regulated learning processes that are influenced by evaluative judgment.

Zimmerman's self-regulated learning model and evaluative judgment

Zimmerman's is the most cited self-regulated learning model, which shows its importance for the field (Panadero, 2017). Grounded in sociocognitive theory, Zimmerman's model (2000) is organised around three recursive phases labelled as forethought, performance and self-reflection that contain a balanced representation of cognitive, motivational and emotional processes. We explore each phase in turn while considering the connection to evaluative judgment when exploring the six connections shown in the model (see Figure 1).

During the forethought phase, students can establish goals aligned with the instructional demands and how to reach them influenced by their evaluative judgment (see bullet point 1 at figure 1). For example, knowledge about assessment criteria —e.g. appreciating the features of a rubric—can have a positive effect on how realistic are students' expectations and goals. Additionally, students' goals are affected by the "*level of perfection that the student wants to achieve*" (Panadero & Alonso-Tapia, 2013 p. 558). This level of perfection will be then influenced by the student's understanding of quality and standards. As discussed earlier, understanding of quality and standards are crucial for the development of evaluative judgment. Regarding motivational aspects at this phase, evaluative judgment can also impact positively (see 2) as research shows that self-assessment practice has a positive influence in self-efficacy and motivational self-regulated learning aspects (Panadero, Jonsson, & Botella, 2017). Via experience and self-reflections, students can develop greater self-efficacy, which increases their outcome expectations and learning goal orientation.
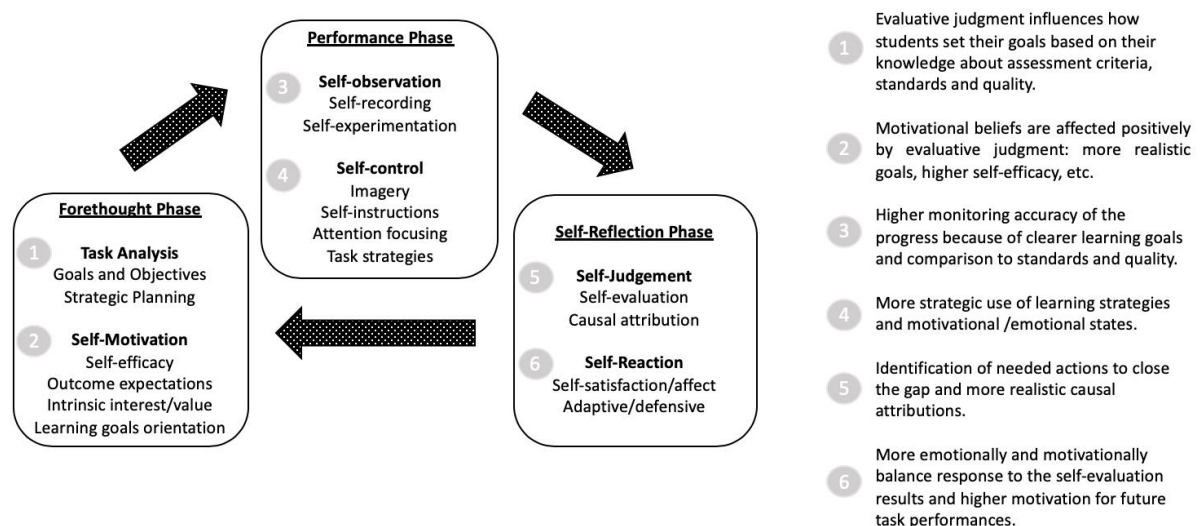

Figure 1. Effects of evaluative judgment on Zimmerman's model

During the performance phase, students compare and monitor their current trajectory against the procedure they have in mind of how their performance should look. In this phase, cognitive and metacognitive processes dominate as students concentrate in performing the

task. However, Zimmerman's model adds a number of motivational strategies (e.g. imagery, interest incentives). Consequently, evaluative judgment can be influenced during this phase in two different areas. First, at the cognitive and metacognitive level, students with a greater level of evaluative judgment will have a clearer model of what the performance should look like because they have more knowledge of standards and quality, and have established more strategic goals in the previous phase (see 3). For this reason, such students are able to monitor their progress more accurately and correct their trajectory accordingly. Consequently, this will influence positively not only the performance but also the enactment of cognitive and motivational strategies, which are the second area (see 4). For example, if the student faces a challenge she will have a larger repertoire of responses if she has more knowledge about assessment criteria, standards, assessment context, etc.

Significantly, Zimmerman's presents motivational and emotional strategies as a key feature: they are central to the performance. On the other hand, in Winne's model these are not central but a result of the performance "…motivational states are products of a phase of self-regulated learning. As soon as a product is generated, it can become a condition contributing to self-regulated learning in future recursions or phases of self-regulated learning" (Winne & Hadwin, 2008 p. 305). Ergo, in this theoretical proposal, it is important to present both models because they conceptualize some aspects differently

Finally, during the self-reflection phase, evaluative judgment becomes salient in this model for two reasons. First, students' evaluative judgment components (i.e. assessment criteria, quality and standards) will influence the self-evaluation of performance (see 5). Having expertize in these components, students will be more accurate self-assessors as they have greater knowledge of how to self-evaluate. This, at the same time, has an effect on the activation of strategies to decrease the gap between the current and desired goal (Andrade, 2018). This happens because they can more clearly identify where things went wrong and

how to correct them. And second, the improved accuracy based on their evaluative judgment helps to manage motivational and emotional processes, such as anxiety and fear of failure, by allowing the student to adapt to the actions required to improve performance (see 6). This response, more emotionally and motivationally adapted, will feed the loop for future performance allowing the students to start with a more positive mindset.

In conclusion, through Zimmerman's model we explored the effects of evaluative judgment on the self-regulated learning processes. Nevertheless, it is necessary to analyse these effects in even more specific cognitive processes and, for that, we need Winne's model as it provides a fuller elaboration of these aspects.

Winne's self-regulated learning model and evaluative judgment

As mentioned, Winne's model presents a detailed schema of the cognitive and metacognitive aspects of self-regulated learning that explains the mental processes students activate when trying to self-regulate their performance (1996, Winne & Hadwin, 1998). We will use this model to visualise how evaluative judgment influences these cognitive processes. This level of detail is needed because it provides clear access to the mental representations that students make when regulating their learning. Nicol and McFarlane-Dick (2006) presented a simplified version of Winne's model linked to seven formative assessment practices that they proposed to be key for self-regulated learning development. However, they did not anchor those practices directly in the model.

Figure 2 presents a simplified version of Winne's model which conceptualises self-regulated learning as a series of coordinated cyclical phases with loose boundaries between them—for more details, see Winne (2011) and Panadero (2017). Before the performance phase, there are task and cognitive conditions that affect students' cognitive processes. Students begin their performance and proceed through four different phases: (1) definition of the task, (2) establishing goals and plans, (3) deploying study tactics and strategies:

Searching, Monitoring, Assembling, Rehearsing and Translating (SMART); and (4)

adaptation. These phases deploy while students evaluate their progress internally via

controlling and monitoring considering Conditions, Operations, Products, Evaluations and

Standards (COPES). Once they receive feedback via external evaluation, they adjust their

conditions (e.g. they gain more knowledge about the task, more advanced interpretation of

the motivational factors and orientations, etc.). These changes in conditions affect future

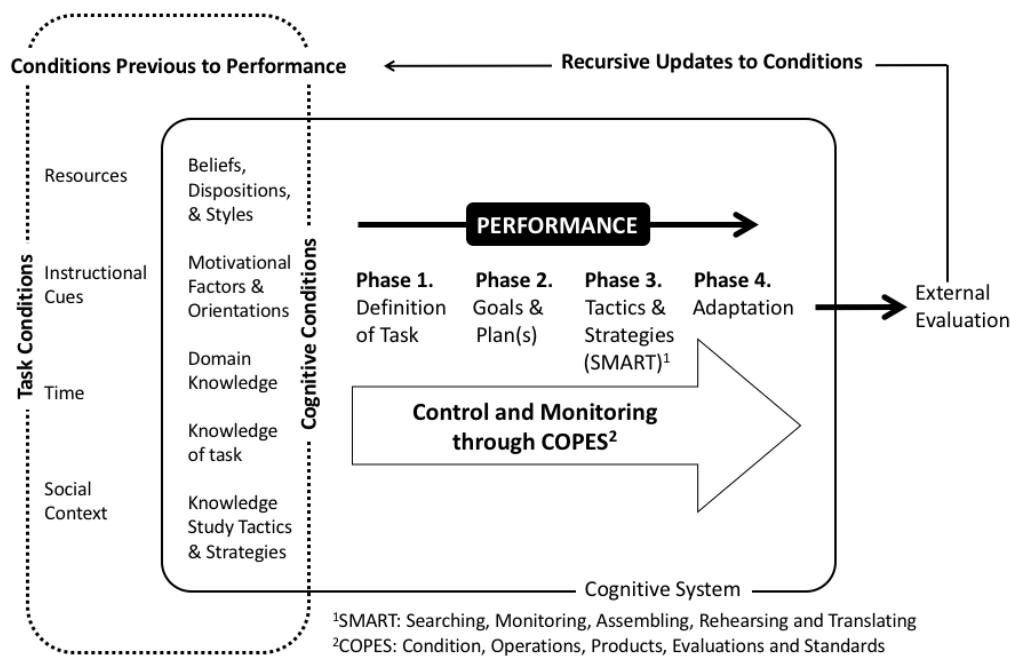performance. It is, therefore, a cyclical recursive loop that feeds back on itself.

Figure 2. Modified version of Winne's self-regulated learning model process

Figure 3 portrays in greater detail what happens as students go through the different

phases while performing a task. This figure represents our interpretation and enhancement of

Butler and Winne's (1995) Figure 2 (p. 260), though our figure has unique features and

additions. In the left part of the figure there is a smaller version of Winne's model (the one

shown in our Figure 2), the performance phase of the Figure 2 is highlighted and enlarged in

the right part of our Figure 3. As can be seen in this section of Figure 3, there are number of

phases and interacting processes.

In phase 1 the learner defines the task by clarifying and developing an understanding of what the task is. In phase 2, the learner establishes the goals and the plans to reach these. The learner identifies, say, four different goal profiles or characteristics (represented by the I, II, III and IV) and different performance levels (represented by the height of the bars). In phase 3 the student put her plans into action deploying study tactics and different strategies (SMART) to reach the goals (Winne & Hadwin, 2008). Even though control and monitoring can happen at any of the four phases, it is during phase 3 that these processes have a salient role. In our figure we include an example of the influence of COPES as can be seen in the corresponding box. At one point, the student has tangible products of the task–i.e. observable results of her performance called "products". These are representations of the current state of the task being performed. In our example, the student realises that there are five (not four) performance profiles (I to V). In other words, there is now an extra characteristic of the task that the student needs to take into account. Then the control and monitoring processes becomes more salient and the student compares her established goals (phase 2) to the current state determining her performance level towards each of the goal profiles. As can be seen in the *control and monitoring box*, she identifies that for I and II he or she is on target, 'too high' for III, and too low for IV. She also identifies that the profile V is extraneous as it was not considered when establishing the goals.

Importantly, we distinguish here two paths that are different from Winne's figures. Small scale adaptation happens if the control and monitoring feeds back to the current performance of the task. For example, if the student decides that the profiles established in phase 2 need to be changed to include the profile V. This type of adaptation can affect the three different previous phases, ergo the different lines leaving the small scale adaptation box to the phases I, II and III. Importantly, if the teacher or a peer gives feedback to the student during the performance this could also influence small scale adaptation. The second path

occurs when the adaptation occurs at "large scale", in other words when the student realizes that those changes need to be incorporated into future performances. This type of adaptation usually happens when the student receives external evaluation at the end of the task (final evaluation) and, in many cases, changes are no longer allowed. It can also happen that the student noticed through self-control and self-monitoring that changes are needed, but lacks the motivation to perform these in the current performance and sets them aside "for future performances". In large scale adaptation, internal and externally produced information will then feed back, influencing future performances because of the changes to the conditions previous to performance.
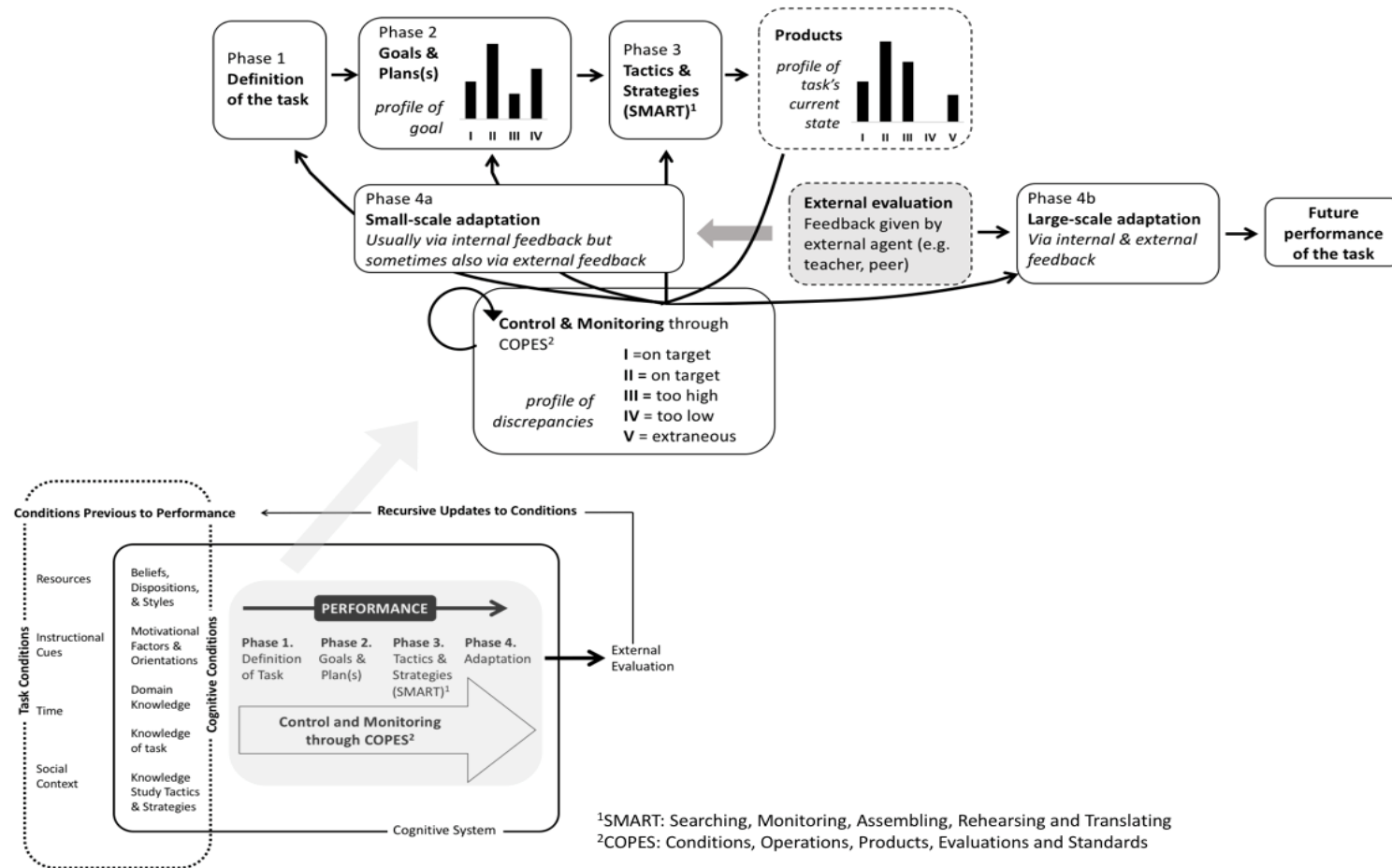
Figure 3. Winne's model redesigned

Figure 4 shows how evaluative judgment influences the self-regulated learning process according to Winne's model. We suggest that there are six instances where this influence occurs (highlighted in Figure 4 using numbers 1 to 6). Before performing an assessment, students bring with them a range of cognitive and task conditions that influence how they approach the task (see 1). Among these, there is prior knowledge that includes task domain content knowledge, but also knowledge about how to meet and judge the task requirements. These are largely influenced by evaluative judgment (e.g. assessment criteria, standards). A lack of experience in the domain, will lead students to rely on intuitive heuristics to make judgments. The empirical evidence from laboratory studies in particular points to the problematic nature of these naïve judgments (Lodge, Kennedy & Hattie, 2018). Therefore, without explicitly attempting to address these initial judgments by helping students develop their capacity for making evaluative judgments, there is a likelihood that the development of self-regulated learning will be hampered.

Evaluative judgment also influences the definition of the task (see 2), and the establishment of goals, their profiles and plans (see 3). The more knowledge the student has about assessment criteria, standards, etc., the more accurate and advanced the definition of the task, goals and plans will be. This will have an influence in the whole process as the planning phase is crucial for a correct deployment of self-regulated learning (Winne, 2011). Additionally, for the definition of products (see 4) and throughout the control and monitoring (see 5), evaluative judgment is crucial because this type of knowledge is central to the creation of correct Conditions, Operations, Products, Evaluations and Standards (COPES).

Lastly, performance is assessed, and external information from others (teacher, peers) is received (see 6). The student uses the feedback information in two ways. First, to reconfigure their knowledge about the piece of work, which is an essential part of point 1, and which builds the student's judgment about how to approach the task next time. Second,

the feedback is used to improve the student's self-evaluation process (Butler & Winne, 1995), a key element of evaluative judgment through enabling the student to judge the accuracy of their self-assessment. This metacognitive activity is also an important component of self-regulated learning (Paris & Paris, 2001).

In conclusion, through the analysis of Winne's and Zimmerman's models, we have explored how evaluative judgment affects the student's self-regulation. Why is it necessary to present two models? If we want to have a more holistic comprehension of all the processes (cognitive, emotional and motivational) Zimmerman's provides more detailed access. However, if the teacher or researcher wants to focus more on the cognitive processes then Winne's is more powerful as it goes one step deeper into such mental activities.

Which one to choose? It depends on the research and teaching focus but, also, the educational level. Research supports the idea that primary and higher education students might benefit more from interventions based on sociocognitive self-regulated learning models (e.g. Zimmerman), while secondary students need a higher level of metacognitive intervention (e.g. Winne) (for a detailed discussion see Panadero, 2017). Now that we have presented the individual level we need to discuss what happens at the interactional one.
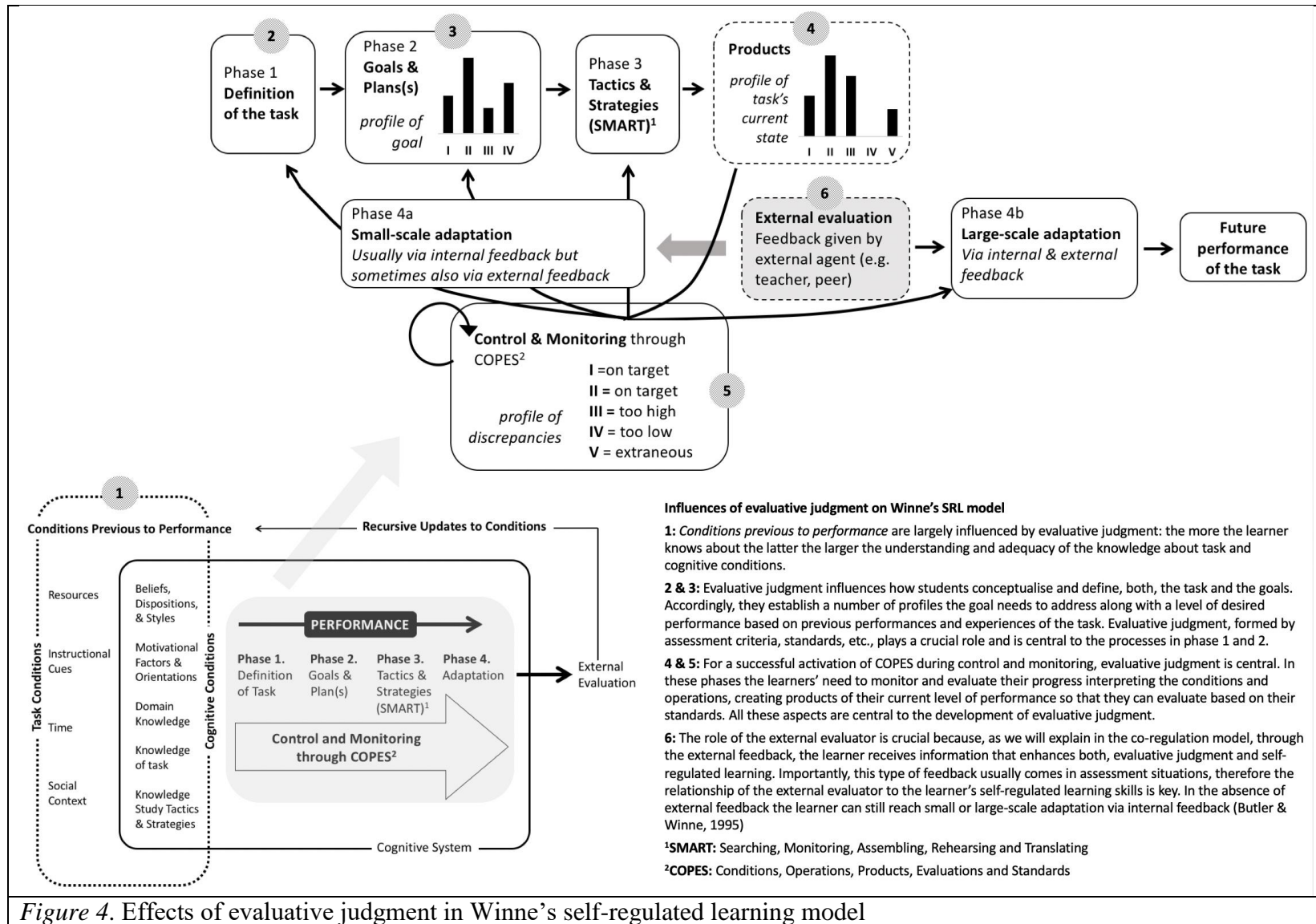
Figure 4. Effects of evaluative judgment in Winne's self-regulated learning model

Co-regulation of learning and evaluative judgment: A closer look to what happens at the interactional level

As mentioned earlier, a number of authors (Allal, 2016; Andrade & Brookhart, 2016) have claimed that assessment acts to co-regulate students or, in other words, it teaches them how to self-regulate. Allal (2016) made two claims in this regard (p. 264): (1) in the classroom all learning is co-regulated; and (2) the self-regulatory processes are the core mechanism of learning. Importantly for her claims, learning then depends on both students' own regulation of goals and actions (already explained through Zimmerman's and Winne's models), and classroom social/contextual variables shaped by the interactions students establish with their peers and teachers. These provide information that helps the student to learn how to regulate his learning.

Though there are competing models of co-regulation of learning (Allal, 2016; Hadwin, Järvelä & Miller, 2017), here we use the most common framework from the assessment and regulation literature (Panadero et al., 2018). This framework discusses the concept of co-regulation as an overarching construct instead of just one type of regulation among others (Allal, 2016). For the *particular purposes of classroom assessment*, we therefore adopt the following definition:

> Co-regulation is defined as the joint influence on student learning of the learner's processes of self-regulation and of the sources of regulation in the learning environment: namely, the structure of the teaching/learning situations, the teacher's interventions and interactions with students, the interactions between students, the materials, artifacts and tools used for instruction, and—in particular—for assessment. (Allal, 2016, pp. 263)

A key aspect of the application of co-regulation ideas to assessment instances is that it is not just the regulatory actions that get transferred from the teacher or peer to the assessee

(i.e. the latter learns how to regulate from observing the model offer from the teacher or peer) (Brookhart, 2016). Evaluative judgment also gets transferred in the interaction. For example, when a teacher provides feedback comments to an assessee it can include information about different strategies that can be used (what Hattie and Timperley (2007) labelled as self-regulation level) and also about the assessment context, quality, standards, and criteria. Through that interaction, the learner appropriates regulatory actions and evaluative judgment from the assessment instance.

In Figure 5 we present our model on how teacher and peer assessment co-regulates the acquisition of regulatory strategies and evaluative judgment to the assessee. In the left part of the figure, is the task performed by the assessee, for example, producing a summary. The co-regulator (i.e. teacher or peer) assesses that product using his or her own regulatory strategies and evaluative judgment. These regulatory processes will be affected by the four aspects that we previously discussed: context, quality and standards, criteria and expertise; just as shown earlier with Zimmerman's and Winne's models.
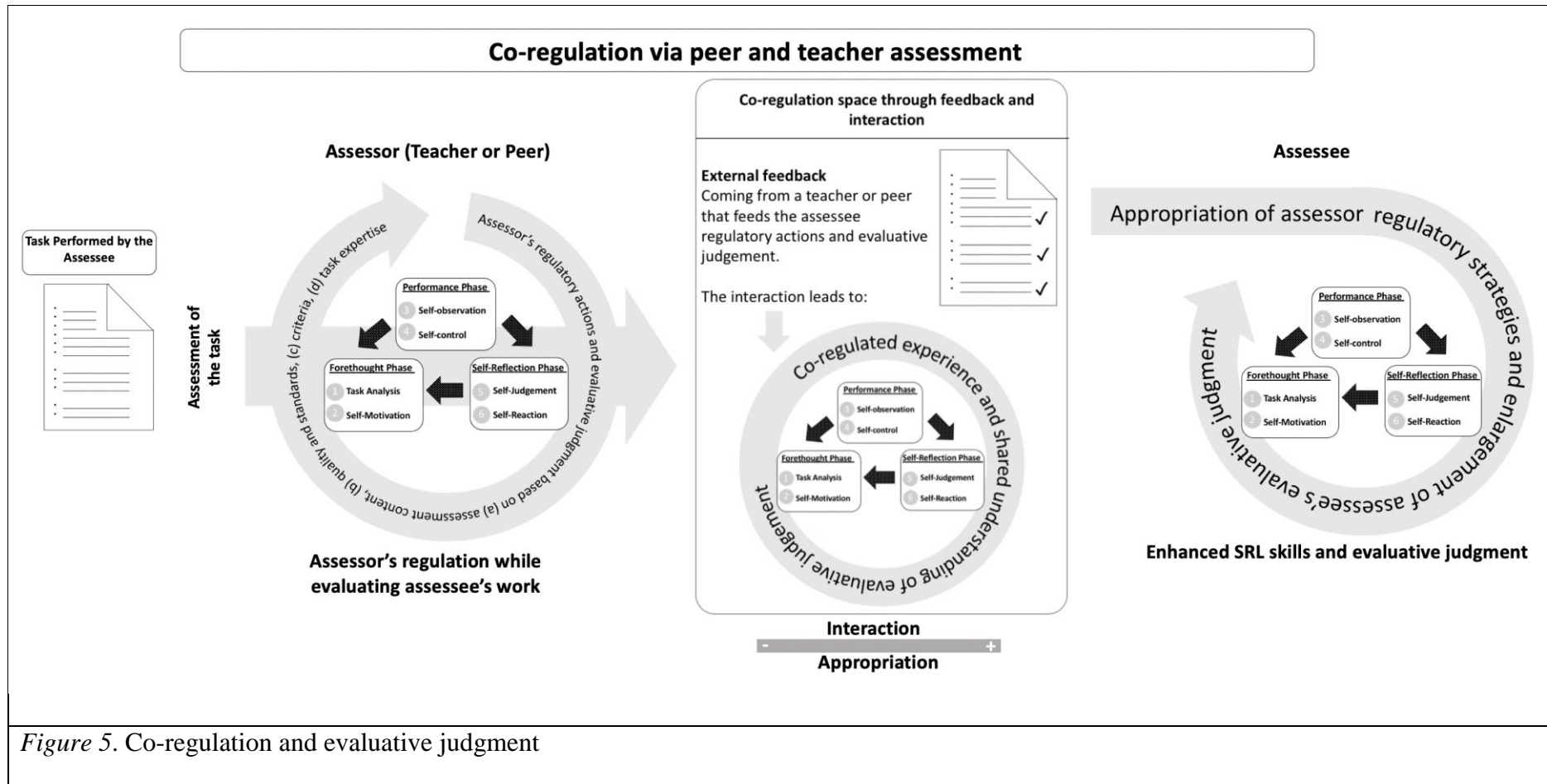
Figure 5. Co-regulation and evaluative judgment

Once the co-regulator provides feedback information to the assessee a co-regulation space emerges. This is where the interaction occurs: when the assessor informs the assessee about his or her performance. This space is crucial for the assessee to internalise the assessor's regulatory actions and evaluative judgment. Here we want to emphasise three characteristics of this space that influences the appropriation:

a) The quality of the feedback information: the more effective, the greater the learning. Hattie and Timperley (2007) proposed four levels of feedback: task, process, self-regulation and self. We should note, however, that teachers' feedback practices have typically not operated across all four aspects. It has been concentrated predominantly on judgments made by the assessor about the task or process (Hattie & Timperley, 2007). In more recent studies (e.g. Dawson et al., 2018) there are signs that feedback inputs by teachers in higher education are increasingly focused on strategies for improvement, i.e. planning. Strategies focused on directly influencing students' judgments of their own work are however evident in the self-assessment literature (e.g. Boud, Lawson & Thompson, 2015).

b) The explicitness of the feedback about self-regulated learning and evaluative judgment: if the information integrates regulatory and evaluative judgment information, such as giving direct feedback on how to self-regulate, the appropriation of the assessor's regulatory schemas is significantly higher by the assessee. This is, of course, in relationship to the self-regulatory feedback level but also to the process feedback level as, when giving feedback about evaluative judgment (e.g. criteria, assessment context), the assessor is helping the assessee to learn about the process.

c) The level of interaction: as shown by the interaction/appropriation continuum at the base of the co-regulation space, the more intense, the higher the chance for the assessee to appropriate the assessor's regulatory actions via assessment. In respect of intensity we are referring to aspects such as the contact between the assessor and assessee (e.g. anonymous peer-grading vs. face to face feedback delivery). The more interaction then, the more salient the co-construction of meaning between the assessor and assessee self-regulated learning and evaluative judgment will be.

The right part of the figure represents the appropriation of the assessor's assessment expertise (i.e. evaluative judgment) and regulatory actions by the assessee. Via the feedback and interaction received, the assessee will be able to interiorise assessment information in the four aspects (context, quality and standards, criteria, and task expertise) and also improving his/her self-regulated learning skills. Importantly, the integration of the appropriated regulatory actions will influence the learner in the ways discussed in Winne's and Zimmerman's models. In other words, co-regulation at the interactional level goes down to having the assessee improve his own self-regulation as shown in the previous section.

Instructional implications

In this final section, we consider what teachers can do to enhance students' development of evaluative judgment which, in turn, should increase self-regulatory strategies. Firstly, at a more general pedagogical level, appropriate use of the five elements proposed in Tai et al. (2018) are a starting point: self-assessment, peer assessment, feedback, rubrics and exemplars. However, it is the particular ways in which they are deployed, not their general presence that is important. They have each to focus on aspects of the evaluative judgement components to promote expertise (e.g. identification of criteria, feedback as instances to deliberate practice). We also can consider the seven principles identified by Nicol and

McFarlane-Dick (2006) (Table 1). These principles point to practices that help students to develop evaluative judgment by promoting components (criteria, standards) and emphasizing opportunities for practice in closing the gap between present and desired performance.

Table 1
Seven principles of good feedback practice by Nicol and McFarlane-Dick (2006)
1. helps clarify what good performance is (goals, criteria, expected standards)
2. facilitates the development of self-assessment (reflection) in learning
3. delivers high quality information to students about their learning
4. encourages teacher and peer dialogue around learning
5. encourages positive motivational beliefs and self-esteem
6. provides opportunities to close the gap between current and desired performance
7. provides information to teachers that can be used to help shape teaching

At a more specific level, there have been a number of guidelines on how to implement self and peer assessment to have a higher impact on learning (Andrade & Valtcheva, 2009; Ross, 2006; Topping, 2003). Panadero, Jonsson and Strijbos (2016) consolidated these into two lists (Table 2). It is through self and peer assessment that students get more deeply involved in assessment decisions and, as we argued earlier, deliberated assessment practice is key for developing judgment.

Table 2

Guidelines for implementing self and peer assessment with formative purposes

Self-assessment	Peer assessment
1. Define the criteria by which students assess their work	1. Clarify the purpose of PA, its rationale and expectations to the students
2. Teach students how to apply the criteria	2. Involve students in developing and clarifying assessment criteria
3. Give students feedback on their self-assessments	3. Match participants (e.g., individuals, groups) in a way that fosters productive PA
4. Give students help in using self-assessment data to improve performance	4. Determine the PA format (e.g., rating with or without comments) and mode of PA interaction (e.g., face-to-face or online)
5. Provide sufficient time for revision after self-assessment	5. Provide quality PA training, examples and practice (including feedback about PA)
6. Do not turn self-assessment *exclusively* into self-evaluation by *asking the students to just provide* a grade	6. Provide rubrics, scripts, checklists or other tangible scaffolding for PA
	7. Specify PA activities and timescale
	8. Monitor the PA process and coach students

Lastly, at the most specific level, authors (Panadero & Broadbent, 2018) present a model of the development of self-regulatory skills that can be applied to the enhancement of evaluative judgment. The multi-level model by Zimmerman (2000) represents four phases along which the ability to self-regulate is acquired: (a) observation: vicarious learning via a model; (b) emulation: imitative performance of the model; (c) self-control: independent performance of the model's skill under structured conditions; and (d) self-regulation: adaptive use of the skill in challenging and novel environmental conditions. The four phases

can be used when conceptualizing the development of evaluative judgment: students can learn via a model that provides criteria, standards, etc. (e.g. the teacher modeling via an exemplar); start to emulate that model; practice the performance (e.g. peer assessment of the task) under structured conditions (e.g. using a rubric, receiving teacher feedback); and then reach self-regulation once they have mastered the performance. Importantly, this idea shows that evaluative judgment use can also be strategic, ergo self-regulated. This means that the influence can be mutual and they can be highly correlated but they are separate concepts. Self-regulated learning is a high-level skill that can be taught. Nevertheless, many students struggle to develop this skill, but that does not mean that they cannot develop evaluative judgment. For example, students can know what quality looks like, the criteria by which they will be assessed and in what context. In reference to assessment, they can know what they need to do to be successful. However, that does not mean they can actually put everything into action, managing their time, reflect on their progress and incorporate their own and others feedback to get it done. In others words, they can have evaluative judgment but have inadequate self-regulatory strategies.

Conclusions

　　Researchers have been exploring the connections between formative assessment and self-regulated learning for some years. It is a vibrant area of investigation that is receiving more attention and in which the studies are clarifying key issues. Importantly, the connection between students' assessment expertise, mostly practised through self- and peer-assessment and now conceptualised as the development of evaluative judgment, needs further theorising using models of self-regulated learning. Future research should explore in details how the development of evaluative judgment influences self-regulated learning skills. This could be achieved conducting studies in which the effect of the acquisition of evaluative judgment components (e.g. assessment criteria) in self-regulation is explored. These types of studies

would be easy to implement, just focusing in one of the components at a time and measuring

self-regulated learning via process data such as thinking aloud protocols.

Our paper has contributed to this process through anchoring assessment expertise to

the self-regulated learning models by Winne and Zimmerman and co-regulation theory. It

points to the necessary interplays between teachers and learners and between learners.

Through a more directed focus on building self-regulatory capacity in learners by thoughtful

pedagogic interventions, learners develop not only the ability to improve their conduct of

current tasks, but go beyond these to develop the metacognitive and dispositional qualities

needed to direct and monitor their learning in new situations. It is our belief that, if we aim

for a pedagogy that emphasises the teaching of self-regulatory skills aligned with the

development of evaluative judgment, our students will benefit by practising and mastering

these two key lifelong learning skills.

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