



# USING FEEDBACK TO ENHANCE LEARNING AND TEACHING

MUHAMAD SAIFUL BAHRI YUSOFF

*Nurturing and Empowering Future Talents*



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Pocket Book Series: Using Feedback to Enhance Learning and Teaching

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# Preface

Dear Readers,

Teaching & Learning (T&L) has always stimulated the development of various philosophies and approaches, all with the common goal of achieving the best possible learning outcome. Academicians are responsible for inculcating learning skills in students and for nurturing and empowering future talents. In that spirit, a wide range of specific methodologies has been designed to support the T&L practice. Moreover, these methods are continuously being improved and/or altered to fit the ever-changing demographics, environment, and mindset of learners. The Centre for Academic Excellence & Student Advisory and Development (CDAE) has taken this opportunity to publish the Teaching and Learning Enhancement Series, which provides materials pertaining to T&L that are expected to provide an overview and deeper understanding of specific T&L methodologies. We hope that these e-books will help lecturers attain a deeper understanding on the various approaches of T&L.

Professor Abd Karim Alias  
Director  
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and Development (CDAE)

# Synopsis

The author begins with an exploration of the concept of feedback and the research findings related to its influence on learning and teaching. The findings are discussed in relation to different types of feedback and their functions in promoting student learning and improved teaching, the reactions of students and teachers to them, and their connections with assessment. The author then proposes a feedback model to identify the contexts under which feedback has the greatest impact. Some common challenging issues regarding feedback are also discussed. Finally, the model is used to demonstrate how feedback can augment learning and teaching, particularly in classrooms.

After reading this guidebook, readers should be able to describe the concept of feedback, explain different types of feedback, recognize the purposes of giving feedback, devise effective ways to deliver feedback, and use it in appropriate contexts to augment learning and teaching in the classroom.

# 1.0

## The Concept of Feedback

Feedback is widely recognized as a tool to enhance performance and practice in various educational settings (Archer, 2010; Hattie & Timperley, 2007; Jamtvedt et al., 2006; Veloski et al., 2006). Therefore, it is considered to be an essential element to promote cognitive, technical, and professional development (Archer, 2010). A few conceptual definitions include the following:

*Feedback is information with which a learner can confirm, add to, overwrite, tune or restructure information in memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies.*

(Winne & Butler, 1994, pg. 5740)

*Feedback is to communicate an individual status in relation to a standard of behavior or professional practice.*

(Veloski et al., 2006, pg. 120)

*Feedback is conceptualized as information provided by an agent (e.g., teachers, peers, books, parent, self, experience) regarding aspects of one's performance or understanding.*

(Hattie & Timperley, 2007, pg. 81).

*Effective feedback may be defined as feedback in which information about previous performance is used to promote positive and desirable development.*

(Archer, 2010, pg. 101)

Based on these concepts, feedback is considered to be a result of previous performance and practice (Hattie & Timperley, 2007). Examples of feedback include the following: 1) a teacher can provide information to correct a practice; 2) a friend can provide information to clarify understanding; 3) a learner can refer to an answer key to evaluate the accuracy of an answer; and 4) an individual can self-reflect on a past experience to improve future action.

To facilitate our understanding of the purposes, effects, and types of feedback, it is helpful to envision a continuum of teaching and feedback (Figure 1) (Hattie & Timperley, 2007). At one end of the continuum is instruction (i.e., teaching) and at the other end is feedback.

## Continuum



**Figure 1:** Illustration of a continuum of teaching and feedback

Without learning context, feedback has no effect. For feedback to have the greatest impact there must be a learning context or a teaching context in which feedback is addressed. In other words, the focus of feedback is an integral element of effective feedback (Hattie & Timperley, 2007). Feedback must provide specific information related to the learning task or process in order to reduce discrepancy between what is understood and what is supposed to be understood (Hattie & Timperley, 2007).

In reality, feedback is part of teaching, and it takes place after a learner has been taught something. Practically, information about some aspect of the learning performance is provided as feedback. Feedback can be provided in numerous different ways, including as an affective process (e.g., providing motivation, inciting increased effort and engagement) and a cognitive process (e.g.,

restructuring understanding, guiding learners toward directions that they could pursue, and suggesting relevant strategies to comprehend certain knowledge). In addition, feedback can be either active or passive. Active feedback occurs when an individual seeks feedback from an instructor and passive feedback occurs when an individual is given feedback by an instructor.

In the context of learning and teaching in higher education, students can seek feedback from teachers to improve the learning experience, and teachers can seek feedback from students to improve the instructional design (i.e., their teaching). Therefore, having a good understanding of the concept of feedback may help teachers and/or students enhance the learning and teaching environment in higher education. In a nutshell, using feedback effectively is an important strategy to ensure a worthwhile learning and teaching experience in higher education.



# 2.0

## Evidence for the Effects of Feedback on Learning and Teaching

*Feedback can have a very powerful effect on learning*

(Hattie & Timperley, 2007; Norcini, 2010).

*Feedback alone had a positive feedback on performance and achievement* (Hattie, 1999; Norcini, 2010; Veloski, et al., 2006).

### 2.1 How Effective is Feedback in the Educational Context?

In an extensive review of over 500 meta-analyses involving hundreds of thousands of studies and effect sizes, millions of students reported that feedback has a strong influence on learning achievement (Hattie, 1999; Hattie & Timperley, 2007). These reviews revealed over 100 factors that influence educational achievement, such as school attributes, students, teachers, and curricula (Hattie, 1999; Hattie & Timperley, 2007). It is obvious that teachers' roles are more important to enhance learning than the level of student maturation (Table 1). However, innovations in schooling can improve learning beyond the teacher effects (Hattie, 1999; Hattie & Timperley, 2007).

**Table 1:** Normative comparison of effect size on learning

Factor	Effect size <sup>1</sup>
Student maturation	0.10
A teacher in front of a classroom	0.24
Innovations in schooling	0.40

Source: Hattie (1999). <sup>1</sup>Effect size is an indicator to measure the magnitude of an intervention effect (e.g., effect size for innovations in schooling was +0.40; this result indicated that learning achievements were improved by 40% of a standard deviation as a result of the innovations).

**Table 2:** The top 10 factors that influence student achievement

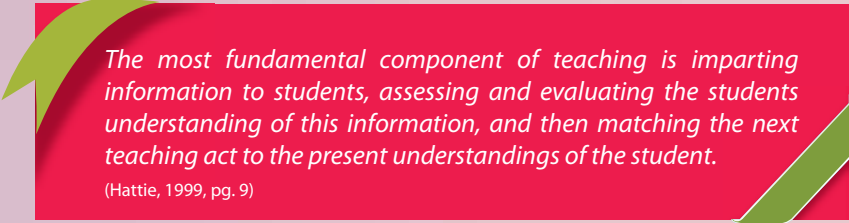
Rank	Factor	Effect size
1	Reinforcement	1.13
2	Student prior cognitive ability	1.04
3	Instructional quality	1.00
4	Instructional quantity	0.84
5	Direct instruction	0.82
6	Feedback	0.79
7	Acceleration	0.72
8	Remediation	0.67
9	Student disposition to learn	0.61
10	Class environment	0.56

Source: Hattie (1999) and Hattie & Timperley (2007)

The average effect size of innovations in schooling on educational achievement was 0.40 (educational achievement was improved by 40% of a standard deviation) (Table 1). However, the effect size of feedback was 0.79 (Table 2), which is about twice the average effect size of innovations in school (Hattie, 1999; Hattie & Timperley, 2007; Norcini, 2010). In addition, feedback was ranked among the top 10 factors that influence educational

achievement (Table 2) (Hattie, 1999; Hattie & Timperley, 2007). As mentioned by Hattie (1999), “The most powerful single moderator that enhances learning achievement is feedback.”

Through feedback, teachers know the extent of information students have learned as a result of their teaching, and students know the extent of information they have to learn to improve their performance. This is reflected in the statement below:



*The most fundamental component of teaching is imparting information to students, assessing and evaluating the students understanding of this information, and then matching the next teaching act to the present understandings of the student.*

(Hattie, 1999, pg. 9)

Even though the impacts of feedback were reported mainly for learning achievements, these results could also be applied to the teaching context because teachers are always learning how to improve their teaching performance. Therefore, feedback plays a vital role in enhancing both learning and teaching in the classroom.

## 2.2 Types of Feedback and How they Improve Learning Achievements

*Some types of feedback are more effective than others.*

(Hattie & Timperley, 2007; Norcini, 2010)

**Table 3:** Types of feedback and their effects on learning achievements

Rank	Types of feedback	Effect size
1	Cues	1.10
2	Feedback	0.95
3	Reinforcement	0.94
4	Video or audio feedback	0.64
5	Computer-assisted instructional feedback	0.52
6	Goals and feedback	0.46
7	Student evaluation feedback	0.42
8	Corrective feedback	0.37
9	Delayed versus immediate	0.34
10	Reward	0.31
11	Immediate versus delayed	0.24
12	Punishment	0.20
13	Praise	0.14
14	Programmed instruction	-0.04

Source: Hattie & Timperley (2007)

Previous studies revealed that feedback has the greatest impact on learners (i.e., students or teachers) who received information feedback about a learning task and strategies to improve it in the future (Hattie & Timperley, 2007) (Table 3). Feedback has the least effect on learners who received praise, rewards, and punishment (Hattie & Timperley, 2007) (Table 3).

*The focus of feedback influences its effectiveness.*

(Hattie & Timperley, 2007)

The focus or direction of the feedback has a strong influence on learning achievement (Hattie & Timperley, 2007; Kluger & DeNisi, 1996), as summarized in Table 4. Feedback seems to have a better impact on learning achievement when it provides correct information rather than incorrect information (Hattie & Timperley, 2007; Moore & Kuol, 2005). In addition, the impact is augmented if the feedback provides information based on what learners have learned or experienced from the previous instruction (Hattie & Timperley, 2007; Moore & Kuol, 2005). The impact of feedback on learning achievement also depends on the degree of complexity of the goals and tasks (Hattie & Timperley, 2007; Moore & Kuol, 2005). Feedback has the greatest impact when goals are specific and challenging, when it occurs in a low-threat environment, and when task complexity is low (Hattie & Timperley, 2007). In addition, providing feedback through technology (i.e., a computer) seems to have better effects on learning achievement than traditional. Praise for task performance and discouragement as feedback strategies appear to be ineffective (Table 4).

**Table 4:** Focus of feedback and its effects on learning

Focus of feedback	Effect size
<b>Correct feedback</b>	
Correct responses	0.43
Incorrect responses	0.25
<b>Task feedback about changes from previous trials</b>	
Yes	0.55
No	0.28
<b>Task feedback designed to discourage the student</b>	
Yes	-0.14
No	0.33
<b>Praise feedback about the task</b>	
Yes	0.09
No	0.34
<b>Feedback provided from a computer</b>	
Yes	0.41
No	0.23
<b>Number of times feedback was provided</b>	
Lots	0.32
Little	0.39
<b>Task complexity</b>	
Very complex	0.03
Not complex	0.55
<b>Goal setting</b>	
Difficult goals	0.51
Easy, do your best goals	0.30
<b>Threat to self-esteem</b>	
Much threat	0.08
Little threat	0.47

Source: Hattie & Timperley (2007) and Kluger & DeNisi (1996)

## 2.3 Reactions of Students and Teachers to Feedback

This section describes ways in which students and teachers react to feedback.

*Feedback can be perceived in negative or positive ways.*

(Moore & Kuol, 2005)

There are many ways to provide feedback to teachers about their teaching performance, including student evaluation, peer review, portfolio, self-evaluation, administration evaluation, and student outcomes (Berk, 2005; Berk et al., 2004). Although debate continues about the value of these methods, over the past three decades student evaluation has emerged as the main feedback method used to evaluate teacher performance (Berk, 2005; Berk et al., 2004; Moore & Kuol, 2005). The use of student evaluation has been the subject of substantial debate among academicians (Moore & Kuol, 2005). In addition, there has been substantial evidence of teachers' unfriendliness and skepticism toward student evaluation (Berk et al., 2004; Nasser & Fresko, 2002; Schmelkin et al., 1997).

**Table 5:** Positive and negative arguments related to using student evaluation as a feedback tool to evaluate teacher performance

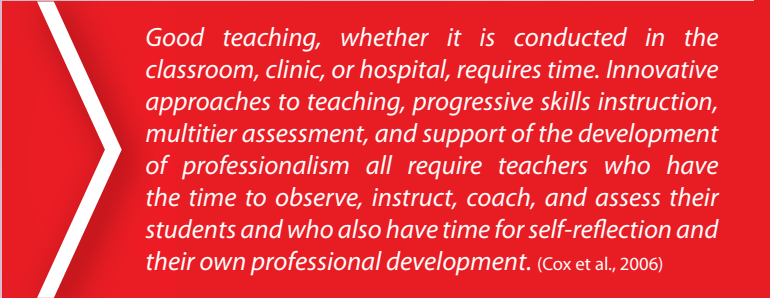
Positive arguments	Negative arguments
Students can provide useful information about the effectiveness of teaching methods, equity in the evaluation/teaching process, faculty focus on the students, and faculty enthusiasm and interest in the course content.	Students are not an appropriate or effective source to evaluate teaching.
It provides an important developmental opportunity for students to provide feedback about instructional design.	Students' motivation and expected grades could bias student evaluation.
Student evaluation can avoid the proliferation of misleading information and feedback about teaching that is based on hearsay and anecdotes.	Student evaluation of teaching is more likely to be a "personality contest" rather than a valid measure of teaching effectiveness.
Student evaluation that uses responses from a representative sample of students in a specific class setting can help to identify teaching problems or issues.	Student evaluation of teaching can lead to "grade inflation" and a lowering of standards.
In diverse classroom settings, student evaluation can identify groups of students that encounter certain difficulties.	Student evaluation requires students to respond to performance issues that are beyond their own knowledge and experience.
Using a teaching-related measurement instrument can confer on the dimensions of teaching role.	The motive for implementing student evaluation in the educational contexts is neither educationally sound nor focused on fulfillment of the goals of either teachers or students.
Student evaluation can give rise to significant improvements in the student learning experience.	Student evaluation primarily serves the needs of the bureaucracy in order to fulfill relatively shallow notions of what teaching quality represents.

Source: Moore & Kuol (2005) pg. 59–60

Despite the criticisms and debates surrounding the value of student evaluation, the focus in higher education on quality, accountability, and the importance of "reflective practice" in teaching has led to the increased use of student evaluation as a tool to provide feedback about teacher performance (Moore & Kuol, 2005). Indeed, a large percentage of faculties showed positive



attitudes about the usefulness and validity of student evaluation as a tool for improving teaching performance (Nasser & Fresko, 2002). The pros and cons of student evaluation as a feedback tool for teacher performance are summarized in Table 5.

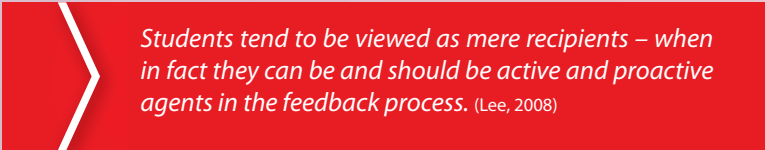


*Good teaching, whether it is conducted in the classroom, clinic, or hospital, requires time. Innovative approaches to teaching, progressive skills instruction, multitier assessment, and support of the development of professionalism all require teachers who have the time to observe, instruct, coach, and assess their students and who also have time for self-reflection and their own professional development. (Cox et al., 2006)*

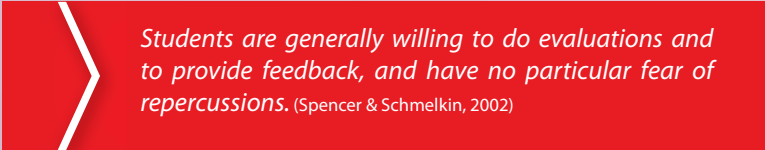
All methods of feedback have strengths and flaws, thus the use of multiple evaluation methods is a wiser approach, as different methods could compensate for flaws in any one feedback method used (Epstein, 2007).



*Despite the important roles students play in the feedback process, much of the feedback research has put teachers at the centre of the stage. (Lee, 2008)*



*Students tend to be viewed as mere recipients – when in fact they can be and should be active and proactive agents in the feedback process. (Lee, 2008)*



*Students are generally willing to do evaluations and to provide feedback, and have no particular fear of repercussions. (Spencer & Schmelkin, 2002)*

Apart from the teachers' reaction to feedback, students' attitudes towards receiving and giving feedback are important to understand (Lee, 2008; Spencer & Schmelkin, 2002). As teachers give feedback to students, it is also important that students' comments are fed back to the teachers as a mechanism to improve effective feedback practices (Lee, 2008). Student reactions to feedback are summarized in Table 6.

**Table 6:** Student reactions to giving and receiving feedback

Reaction to receiving feedback <sup>1</sup>	Reaction to giving feedback <sup>2</sup>
Students value teachers' feedback as very useful in helping them improve their learning achievement.	Students perceived that their feedback to teachers is important.
Students prefer teachers' feedback that focuses more on specific than general issues.	Students perceived that they are qualified to rate their teachers.
Students are eager to have all of their mistakes pointed out by teachers.	Students are not too optimistic about the overall weight put by teachers on their feedback.
Students prefer to be actively engaged in the teacher feedback process.	Students are not reluctant to provide feedback to teachers.
Students prefer to be given clues about their errors.	Students do not worry about potential consequences of their feedback to teachers.
Students prefer to get feedback in an appropriate educational context.	Students perceived that they are not biased when providing feedback to teachers.
Students prefer to get constructive feedback.	Students perceived that they lack knowledge to provide feedback that could influence teaching.
Students prefer to have written feedback from teachers.	
Students prefer that teachers provide feedback on content rather than on other aspects of an educational task.	
Academically weak students are more resistant than academically good students to feedback that focuses on errors.	

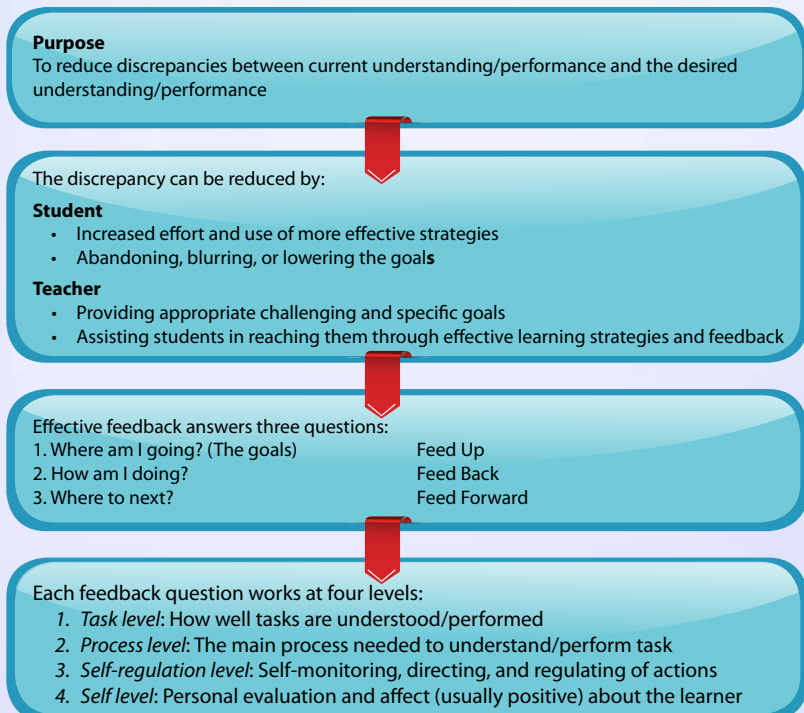
Source: <sup>1</sup>Lee (2008) and <sup>2</sup>Spencer & Schmelkin (2002)

Based on Table 6, it appears that student reactions to feedback are complex. Reactions are related not only to student characteristics such as academic performance but also to factors related to the teacher, such as teacher beliefs and practices, communication with students, and the educational context in which feedback is delivered (Lee, 2008; Spencer & Schmelkin, 2002). In a nutshell, empowering students in the feedback process is a wise approach to improve their learning experience.

# 3.0

## A Model to Identify the Contexts Under which Feedback has the Greatest Impact

Figure 2 presents a feedback framework. Its purpose is to reduce gaps between what is currently understood and what will be understood. This framework emphasizes the importance of feedback being targeted at the appropriate level of learners, as certain types of feedback are more effective than others at reducing the gaps in specific context (Hattie & Timperley, 2007).



**Figure 2:** A model of feedback to enhance learning and teaching  
[source: Hattie & Timperley (2007), pg.87].

### 3.1 How Feedback Works

Feedback works simply by reducing gaps between current understanding/performance and the desired understanding/performance. Table 7 summarizes ways to reduce the discrepancy between the two.

If feedback fails to reduce the gap between what is understood and what will be understood, learners (i.e., students and teachers) might reduce the gap by 1) exaggerating their current learning accomplishment or 2) claiming a variety of learning accomplishments that reduce effort and engagement.

If goals are poorly defined, feedback will not reduce the gap between current understanding and intended understanding because learners will not see valid reasons to put effort into reducing the gap (Hattie & Timperley, 2007). Feedback often is not connected to attainment of important aspects of the intended goal. For example, frequently learners are given feedback on presentation, spelling, and quantity of writing; however, if the intended learning goal for the writing assignment is actually to create mood in a story, such feedback will not be effective in reducing the gap in relation to the intended goal (Hattie & Timperley, 2007).

**Table 7:** Ways to reduce the discrepancy between current understanding and intended understanding

Students	Teachers
<b>Productive Strategy</b>	
Increasing effort to tackle more challenging tasks	Providing appropriate challenging and specific goals
Increasing effort to appreciate higher quality experiences rather than doing “more”	Clarifying goals to reach students through feedback
Developing effective error detection skills that lead to self-feedback	Enhancing commitment to reach students through feedback
Seeking better strategies to complete the task	Increasing effort to reach students through feedback
Obtaining more information from relevant sources to solve problems	Creating a learning environment in which students develop self-regulation and error detection skills
Using self-regulatory abilities	Setting appropriate focus of feedback
<b>Less Productive Strategy</b>	
Abandoning goals	
Picking and choosing goals that can be achieved and ignoring the others	
Changing the standard by setting less challenging goals	
Changing the standard by accepting performance below their capability as satisfactory	

## 3.2 The Three Questions to be Addressed for Effective Feedback

These three questions (“Where am I going?”, “How am I doing?” and “Where to next?”) typically work together in the feedback process (Hattie & Timperley, 2007), as they are integrated and complement each other during the feedback process.

### 3.2.1 Where am I going?

This question refers to a goal setting effort designed to reach intended learning outcomes. Students and teachers set a desired learning goal to be achieved in relation to a task in order to reduce the discrepancy between current understanding and desired understanding.

These goals can be wide ranging and include item such as writing a research proposal, planning a community program, performing in a theater production, or drawing a beautiful picture. Many approaches can be used to evaluate the accomplishment of the desired learning goals, including the following (Hattie & Timperley, 2007):

- i. Direct approach, such as passing an examination and finishing a project;
- ii. Comparative approach, such as doing better than the last examination or doing better than other students;
- iii. Social approach, such as seeking teachers' endorsement or not getting a detention;
- iv. Engagement approach, such as conducting a research project or analyzing research data;
- v. Induction of awareness approach, such as successfully applying the concepts during analysis or looking for more challenging tasks.

The last approach is the best approach because seeking more challenging tasks can encourage goal-directed action (i.e., success on tasks), build determination to successfully perform tasks even when difficulties are encountered, and favor the continuation of challenging tasks even in the presence of more eye-catching options (Bargh et al., 2001). As concluded in a previous study, "the provision of challenging assignments and extensive feedback lead to greater student engagement and higher achievement" (Black & Wiliam, 1998, pg. 12).

**Challenge** and **commitment** are two dimensions of a goal (Hattie & Timperley, 2007), and there are two strategies to setting a **challenging goal**:

- i. Students (and teachers) are informed about the extent of understanding/performance that is to be accomplished, thus they can plan and appraise their actions and efforts accordingly. It lets them set appropriate goals and map their performance based on the goals so that fine-tuning of effort, direction, and even strategy can be made as required (Locke & Latham, 1990). The extent of attainment of the goals is used as indicators of success (Hattie & Timperley, 2007). "Goals without clarity as to when and how a student (teacher) would know they were successful are often too vague to serve the purpose of enhancing learning" (Hattie & Timperley, 2007).
- ii. Students (and teachers) are allowed to set more challenging goals once the previous goals are accomplished; this encourages continuous learning.

**Goal commitment** refers to individuals' commitment to their goals. The strongest relationship between goal and performance occurs when people are committed to their goals (Locke & Latham, 2002). Goals become more valuable and useful when students (and teachers) share a commitment to achieve the goals because they are keen to search for and receive feedback (Locke & Latham, 1990). Commitment can be induced in various ways, such as by authority figures, peer groups, and rewards.

When goals are clearly defined at the appropriate level, students and teachers are committed to these goals, and a clearer view of the success criteria is likely to be shared (Hattie & Timperley, 2007).



### 3.2.2 How am I doing?

Feedback agents (i.e., teachers, students, peers, or self) are needed to provide appropriate information with regard to a task or performance, such as information related to standard criteria for completing critical components of the task or performance. Feedback is valuable when it provides information about how to move forward and directions about how to make progress on a critical component of the task. Most of the time, the question “How am I doing?” will lead to assessment, but this is not the basic concept underlying this question. Assessment always fails to deliver feedback information that can help learners know how well they are doing (Hattie & Timperley, 2007). To obtain the greatest benefit from feedback, the information should be delivered in a specific manner that addresses a critical component of a task or performance and it should be delivered in a low-threat environment (Hattie & Timperley, 2007).

### 3.2.3 Where to next?

Addressing the question “Where to next?” provides information that leads to greater opportunities for learning (Hattie & Timperley, 2007). Examples of feedback that can address this question include providing more challenging tasks, allowing learners to self-direct in their learning process, guiding them with useful strategies that will help them to progress further, provoking deeper understanding of subjects, and addressing what is known and what is not known. This feed forward question can result in the most potent impacts on learning (Hattie & Timperley, 2007).

### 3.3 Focus of feedback

As has been discussed previously, the focus of feedback is vital. The four main levels of focus are as follows:

- i. **Feedback on a task (FT)** involves directions to obtain more information from various sources to verify achievement status related to a task or performance, such as whether a task is correctly or incorrectly done, which later could be readjusted to achieve the desired goals. It also involves directions to obtain more information for building a better learning experience. It is also known as corrective feedback or knowledge of result (Hattie & Timperley, 2007).
- ii. **Feedback on the process (FP)** involves providing appropriate information in relation to the procedure, practice, method, or process used to accomplish a task or to create a product (Hattie & Timperley, 2007). For example, a teacher might say, "You need to use the independent-t test to determine the mean difference in IQ scores between male and female students."
- iii. **Feedback on self-regulation (FR)** involves providing information related to a task or performance that leads to greater skills in self-evaluation and that promotes confidence to engage in more challenging tasks or to advance a deeper understanding of a task. Such feedback can have major influences on learning achievement. For example, "You must know the assumptions of the independent-t test. Check to see whether you have written them in your report."
- iv. **Feedback on self (FS)** involves providing information about the self as a person. For example, "You are a very good student" and "You are very beautiful". This kind of feedback generally does not help a learner to achieve learning goals.

Among these four levels, FR and FP are powerful in terms of deep processing and mastery of a task (Hattie & Timperley, 2007). FT is powerful when information subsequently is used to improve FP or enhance FR (Hattie & Timperley, 2007). The least effective strategy is FS because the feedback is often unrelated to performance on the task (Hattie & Timperley, 2007). The characteristics of each level of focus are summarized in Table 8.

**Table 8:** The characteristics of each level of focus

FT	FP	FR	FS
It is about how well a task is being performed or accomplished and building more surface knowledge.	It concerns the processes underlying tasks or relating and extending tasks, thus providing deeper understanding.	Self-regulation involves interplay between commitment, control, and confidence to accomplish a task.	It is personal feedback and typically expresses positive evaluation and effects about the learner, and it usually contains little task-related information.
It relates to correctness, neatness, behaviors, or other criteria related to task accomplishment.	It relates to students' strategies for error detection.	It addresses the way learners monitor, direct, and regulate actions toward accomplishment of learning goals.	It is not very effective yet is widely used in classrooms.
It is about providing correct or different information.	It provides information as a cueing mechanism and leads to more effective information search and use of task strategies.	It leads to seeking, accepting, and accommodating feedback information.	It is rarely converted into favorable accomplishment or performance of tasks.
It is more powerful when the problem is faulty interpretation rather than lack of information.	Cues are most useful when they assist learners in rejecting errors and provide direction for searching and strategizing.	Its effectiveness is mediated by capability of learners to create internal feedback.	Its effectiveness is very much influenced by learners' self-conception.
It aims to move students from task to processing and then from processing to regulation.	It is more effective than FT for enhancing deeper learning.	Its effectiveness is mediated by capability of learner to self-appraise.	Praise or criticism directed toward personal characteristics has little influence on student achievements. (e.g., "You are a good student.")
It is most beneficial when it helps learners recognize errors and provides cues as to direction for searching and strategizing toward task accomplishment.		Its effectiveness is mediated by the willingness to invest effort into seeking and dealing with feedback information.	Praise or criticism directed toward effort, self-regulation, or processes can assist in enhancing self-efficacy and have an impact on the task (e.g., "You are a good student because you have carefully completed the task by applying these concepts.")
Too specific and too much feedback only at the task level can interfere with task accomplishment.		Its effectiveness is mediated by the degree of confidence or certainty in the correctness of the response.	It should be delivered in ways that enhance learning gains in an appropriate educational context.

Simple rather than complex FT tends to be more effective.		Its effectiveness is mediated by the attribution of success or failure.	Older learners perceive praise after success or neutral feedback after failure as an indication that their ability is low.
Good students are more likely to make efficient use of the FT, whatever its complexity.		Its effectiveness is mediated by the level of proficiency at seeking help.	Younger learners perceive praise as an indication of high ability and criticism after failure as an indication of low ability.
FT can be delivered and received in both individual and group contexts.		It has two types: effort feedback and ability feedback.	FS tends to be more generalized at the self level, thus it is difficult for the teacher to change learning behaviour.
Providing FT through written format is more effective than marks or grades. It is very useful when learning new skills or tasks.		It depends on the stage of task accomplishment. (e.g., effort feedback is more required at the beginning stages, whereas ability feedback is more required as skills develop successfully.	

Source: Hattie & Timperley (2007)

# 4.0

## Common Issues Related to Feedback

The following four issues related to feedback are commonly debated: timing of feedback, effects of positive and negative feedback, feedback and classrooms, and feedback and assessment (Hattie & Timperley, 2007). Each issue will be elaborated further in the next sections.

### 4.1 Timing of Feedback

Generally there are two types of feedback: immediate and delayed (Table 9).

**Table 9:** Characteristics of immediate and delayed feedback

Immediate feedback	Delayed feedback
It is effective to provide instant mistake correction during task performance; this may lead to quicker accomplishment.	It is effective to provide delayed mistake correction during processing of a task when it requires a longer duration to accomplish the task.
Its effects are likely to be more powerful at the task level (FT).	Its effects are likely to be more powerful at the process level (FP).
It is useful for attaining easy learning outcomes because it involves a shorter degree of processing about the task.	It is useful for attaining difficult learning outcomes because it involves a greater degree of processing about the task.

## 4.2 Effects of Positive and Negative Feedback

Negative and positive feedback can have favorable effects on learning. However, these effects vary depending on the feedback levels (i.e., FT, FP, FR, and FS). Negative feedback refers to information given to learners that argues against the learners' understanding or beliefs in relation to a task. Negative feedback is also known as disconfirmation feedback. Positive feedback refers to information given to learners that supports the learners' understanding or beliefs in relation to a task. Positive feedback is also known as confirmation feedback. Table 10 summarizes the effects of positive and negative feedback according to the feedback levels.

**Table 10:** Effects of positive and negative feedback according to feedback levels

Feedback level	Effect	
	Positive feedback	Negative feedback
<b>FT</b>	<ul style="list-style-type: none"> <li>i. Poor feedback delivery can be disregarded by learners.</li> <li>ii. It also can be ignored by learners if the learners' knowledge is insufficient to accommodate additional feedback information.</li> </ul>	<ul style="list-style-type: none"> <li>i. Disconfirmation with adequate information can be effective because it provides relevant information regarding what to do or how to respond next time.</li> <li>ii. Poor feedback delivery can be ignored by learners.</li> <li>iii. It can also be ignored by learners if the learners' knowledge is insufficient to accommodate additional feedback information.</li> </ul>
<b>FP</b>	<ul style="list-style-type: none"> <li>i. Poor feedback delivery can be disregarded by learners.</li> <li>ii. Students will ignore the feedback if their knowledge is insufficient to accommodate additional feedback information.</li> </ul>	

<b>FR</b>	<ul style="list-style-type: none"> <li>i. It is mediated by the learners' commitment to goals and self-efficacy.</li> <li>ii. It increases motivation more than negative feedback for a task that people "want to do."</li> <li>iii. Highly self-efficacious learners take it as a hint of potential ability.</li> <li>iv. For low self-efficacious learners, it may 1) encourage them to increase effort to reach a minimum requirement of performance or 2) lead them to avoid feedback after initial achievement because they have reached an adequate level of performance and additional tests merely put them at risk of getting an unfavorable outcome.</li> </ul>	<ul style="list-style-type: none"> <li>i. It is mediated by the learners' commitment to goals and self-efficacy.</li> <li>ii. It increases motivation more than positive feedback for a task that people "have to do."</li> <li>iii. Highly self-efficacious learners deal with disconfirmation feedback positively.</li> <li>iv. It has negative impacts on motivation and performance of low self-efficacious learners; they might experience negative effect, exhibit less motivation on a subsequent task, and attribute the feedback less to effort and more to ability.</li> </ul>
<b>FS</b>	<ul style="list-style-type: none"> <li>i. It is less potent at the self level because individuals tend to be satisfied with feedback that fits with their self-conception.</li> </ul>	<ul style="list-style-type: none"> <li>i. It is more potent at the self level because individuals will acquire more information to verify their self-conception.</li> <li>ii. Neutral or without praise feedback is more effective than praise if it works together with FT.</li> </ul>

FT = Feedback on task; FP = Feedback on processing of task; FR = Feedback on self-regulation; FS = Feedback on self. Source: Hattie & Timperley (2007)

### 4.3 Feedback and Classrooms

The proposed feedback framework highlights the requirements for teachers to teach effectively. Teachers need to strive for effective teaching because feedback is the consequence of previous instruction (refer to Figure 1). To make feedback effective, teachers must make appropriate judgments about when, how, and at what level to provide appropriate feedback to learners, and they also must determine which of the three questions should be addressed (refer to Figure 2).

A previous study reported that the most common form of feedback in the classroom is praise (FS), which is a poor approach to stimulate learning achievement (Bond et al., 2000). When feedback is given at the self level, it tends to be self related (FS) or at best corrective task related (FT), and usually it is influenced by perceptions of students' needs. For example, the feedback teachers tend to give to male learners is more related to a lack of effort or poor behavior, whereas that given to female learners is more about pleasant characteristics or outcomes (i.e., ability attributions) (Hattie & Timperley, 2007).

Feedback is not only differentially given but also differentially received by learners based on their cultural background. For example, Hattie and Timperley (2007) reported that Asian learners preferred indirect and implicit feedback, more group focus, and no self level feedback (FS), whereas learners from Western countries preferred more direct feedback, particularly related to effort, were more likely to use direct inquiry to seek feedback, and preferred more individual focus and self-related feedback (FS). Therefore, using the appropriate feedback approach at the right time and level could reduce misinterpretation of the feedback information.

The classroom environment is vital, particularly when delivering disconfirmation and corrective feedback to students (and teachers). In addition, it should be done with due diligence if the feedback is expected to be used by the students (and teachers). Researchers have reported that errors and disconfirmation are the most potent agents to stimulate and encourage future learning particularly that which are related to processing (FP) and regulation (FR) (Hattie & Timperley, 2007). Typically, learners respond to feedback only when they are fairly sure that they can respond correctly (Lee, 2008; Spencer & Schmelkin, 2002). It should be noted that errors (and learning from them) are rarely welcomed. Simply providing more feedback is not the solution, because it is necessary to consider the nature of the feedback, the timing, and how a learner receives this feedback (Hattie & Timperley, 2007).



In summary, when providing feedback, teachers need to consider learner diversity in the learning process and be sensitive to providing information that addresses the three feedback questions. Teachers also should devise strategies to help learners engage with these three questions.

#### 4.4 Feedback and Assessment

To reiterate, feedback refers to actions taken by external agents to provide information about some aspects of an individual's task performance (Archer, 2010; Hattie & Timperley, 2007; Kluger & DeNisi, 1996; Veloski, et al., 2006; Winne & Butler, 1994). For feedback to occur, instruction must occur prior to the feedback (Hattie & Timperley, 2007) and task performance must be observed (Norcini, 2010).

Assessment in classrooms describes activities that provide teachers and learners with feedback information in relation to the three feedback questions at different feedback levels (Hattie & Timperley, 2007). Assessment tasks should be designed to provide information about and interpretation of the gaps between current understanding and the desired learning goals at any of the three feedback levels (i.e., about 1) tasks (FT), 2) the processes or strategies needed to understand the tasks (FP), and 3) the regulation, engagement, and confidence in becoming more committed to learning (FR)). This differs from the classic definition of assessment, which refers to activities used to assess learners' level of proficiency and emphasizes grades or scores and focuses less on the interpretation of these grades or scores (Hattie & Timperley, 2007). Unfortunately, there is little evidence that such traditional assessment has aided in the learning process because it involves minimal reflection and interpretation on what is being assessed (Black & Wiliam, 1998).

Assessment feedback aims to "drive" learning (Epstein, 2007) or to "do more" or "do better" (Hattie & Timperley, 2007). However, too often learners receive little feedback information, mainly because assessment feedback does not

concentrate on the three feedback questions. Thus, such feedback rarely augments the process (FP) and self-regulation (FR) of the task (Hattie & Timperley, 2007). In addition, teachers often see assessment as making a testimonial about learners, and they do not view it as being about their teaching effectiveness (Timperley & Wiseman, 2003). Therefore, the significant advantages of feedback assessment in the classroom are often diluted.

There are many ways in which teachers can deliver feedback to their students and students can receive feedback from their teachers, peers, and other sources. Using more tests is not the solution; the solution lies in how the tests are designed (Epstein, 2007).

For students, tests are a means to:

- i. Gain information about what and how well they understood and misunderstood a task;
- ii. Find directions and strategies that they must use to improve their learning achievement;
- iii. Seek assistance to help better understand the learning goals.

For teachers, tests are regarded as a type of feedback about their teaching effectiveness. Test results can help teachers identify which strategies should be used next to improve their teaching.

Assessment can accommodate all of these feedback functions. However, too often assessments are not properly programmed, thus fail to convey an effective feedback to students or to teachers (Hattie & Timperley, 2007).

# 5.0

## Utilizing Feedback to Enhance Learning and Teaching in the Classroom

Feedback is information provided by an agent, such as a teacher, peer, or administrator, regarding some aspects of an individual's performance or understanding. The main aim of feedback is to reduce gaps that exist between current understanding/performance and the desired understanding/performance in relation to tasks. The feedback model described previously (Figure 2) includes three feedback questions that need to be addressed in order to provide effective feedback: "Where am I going?" (feed up); "How am I doing?" (feedback), and "Where to next?" (feed forward).

The answers to these questions will provide insight to teachers and learners about ways to move forward to enhance learning and teaching effectiveness when there are gaps between what is currently known and what is expected to be known in relation to accomplishment of tasks (Hattie & Timperley, 2007). Various approaches to reducing the gaps include increasing effort, motivation, or engagement and increasing cue searching and task processes that lead to understanding. The three questions certainly should not be linearly interpreted or implemented, and the boundaries between them are quite unclear.

Although it is imperative to specify goals, learning experience do not necessarily begin by asking "Where am I going?" because the answer can be discovered as learners undertake particular tasks (Hattie & Timperley, 2007). How many goals are enough? There is no absolute answer; it depends on the requirement of the

tasks. Teachers and students should be aware that too many goals can create conflicts and lead to wider gaps between current understanding and the desired understanding. However, most of the time the accumulated learning goals can lead to the following processes (Hattie & Timperley, 2007):

**01**

Creating options to  
achieve the goals

**02**

Weighing pros and cons  
of options to achieve the  
goals

**03**

Considering the likelihood  
that a given course of action  
will lead to achievement  
of the goals

**04**

Learning about and  
evaluating the consequences  
of achieving the goals

Thus, goals might be stagnant for particular issues, and feedback concerning “How am I doing?” might help to provide relevant information to refine these “stagnant goals” and help the student move towards achieving the desired understanding and performance.

Similarly, the answer to “Where to next?” might be stagnant for particular issues if:

- 1 The goal is rigid and static and the “learning outcomes” focus on the same tasks, thereby leading to “stagnant learning” in which the desired understanding would not be achieved.
- 2 The learners believe that the answer is “Wherever the teachers tell us to go.”

Such situations typically indicate low self-regulation or overly dominant classroom regimes (Hattie & Timperley, 2007). The answer to “Where to next?” must be directed to fine tuning and looking for more challenging goals because these have the highest chance of leading to better learning accomplishment.

Interconnections between the task, process, and self-regulatory levels must be made for effective feedback to occur. In other words, they should be used together in an appropriate context for feedback to have the greatest impact.

Feedback at the task level (FT) has the greatest impact on learning when it is used to correct distorted interpretation, but it is not effective in situations in which learners lack understanding. It also has a significant impact on learning when it assists in generating more information about flawed assumptions and thoughts, which then leads to the development of better strategies to process and comprehend the tasks to be accomplished.

Feedback at the process level (FP) has the greatest impact on learning when it helps students eliminate flawed assumptions and when it provides more information for searching and developing better approaches to complete the tasks. Such information allows learners to fine tune their effort towards attaining required competencies to complete the tasks. Preferably, it should progress from task to process (i.e., understanding that is required to learn the task) and later to

self-regulation (i.e., learners' commitment, confidence, and motivation to engage in more challenging tasks and goals that go beyond the initial task). This process might lead to greater motivation, commitment, and confidence and to greater investment of effort toward achieving more challenging tasks. Commonly, this kind of flow will be seen in learners who have shown a high level of fluency and mastery (Hattie & Timperley, 2007).

Feedback at self-regulation level (FR) has a tremendous impact on learning to the extent that it will lead to a higher level of engagement in terms of spending more effort to accomplish the task, to improve self-efficacy (i.e., one's perception of own capabilities to complete tasks and reach goals), and to generate attributions (i.e., the explanations that one tends to make to explain success or failure) that the feedback is deserved and earned (Hattie & Timperley, 2007). For feedback at the FR level, the following important mediators for learning should be considered:

- 1 Engagement with the task
- 2 Engagement with learners' belief about the significance of expending effort to reach the goals
- 3 Engagement with learners' self-conception about achieving the desired learning goals

Feedback at the self or personal level (FS) (i.e., usually praise) is often ineffective. It rarely addresses the three feedback questions, thus it does not lead to enhancement of learning. When feedback concentrates at the self, learners try to do the following (Black & Wiliam, 1998):

- 1 Avoid the risks involved in handling challenging assignments
- 2 Minimize effort to reach the desired learning goals

To develop the optimal climate in the classroom, teachers and learners need to have appropriate skills in relation to feedback. The skills include the following (Hattie & Timperley, 2007):

01	02	03	04	05
Providing and receiving feedback	Dealing with multiple judgments	Having a good understanding about the learning issues in order to provide feedback regarding tasks or interconnection between thoughts	Readiness to encourage self-regulation	Having the right timing to provide feedback before dissatisfaction becomes dominant

In order to dedicate time, resources, and thought to being responsive to feedback, teachers should tailor various activities in the classroom as an “activity program” and offer all learners various learning opportunities that might augment their understanding on desired learning goals (Hattie & Timperley, 2007).

A challenge for teachers is to ensure that all learners perceive the learning goals as relevant and salient because learners who are prepared to inquire and reflect on what they know and understand are more ready to provide and receive feedback (i.e., both positive and negative), and this situation offers them the best chances for learning.

When providing feedback to weak learners, teachers should devise activities that provide information about poorly understood concepts to reduce the gaps between the learners’ current understanding and the desired learning outcomes.

If feedback is directed to the appropriate level, it can help learners to understand, employ, or build up appropriate strategies to process the information that must be learned (Hattie & Timperley, 2007).

To be effective, feedback must be comprehensible, well focused, have an important educational effect, be presented in a logical manner, and be compatible with learners' prior knowledge. It also needs to be given at an appropriate time. It should provide meaningful information to learners, involve a simple but challenging task in relation to specific and understandable goals, and be delivered in a low-threat environment. These requirements highlight the importance of a classroom climate that encourages peer and self-assessment and that allows learners to learn from errors.

Clearly, teachers should be as ready as learners to look for and learn from various sources of feedback. If assessments address the three major feedback questions, they will provide valuable information to both teachers and learners that might enhance learning accomplishment. Unfortunately, assessments frequently provide insignificant feedback to learners because they are used merely as grades or numbers rather than as feedback devices that are important to enhance teaching and learning processes (Hattie & Timperley, 2007).

Feedback together with effective teaching in the classroom has the greatest impact on learning achievement. However, feedback can only build on previous teaching; it is of little use when there is no initial learning. Feedback is what happens after teaching has taken place, and it is a powerful tool that can influence learning achievement as well as teaching effectiveness (Hattie & Timperley, 2007).



# 6.0

## Challenges to Creating a Culture that Values Feedback

Two main factors challenge the creation of a culture that values feedback. First, teachers are extremely busy and their lack of time is a major obstacle. It is very important to reward busy teachers in a way that recognizes their dedication to a culture of feedback, and administrators must provide them with time to engage in and cultivate it (Norcini, 2010). Second, faculty training programs are needed to ensure that the feedback process will optimize the learning process and augment the quality of teaching (Norcini, 2010).

# 7.0

## Take-home Message

1. There is substantial evidence showing that feedback is an effective tool to enhance learning and teaching.
2. There is ongoing debate about which source of feedback has the most potent effect on learning and teaching.
3. Feedback has the greatest impact on learning and teaching when it is delivered with specific and clear directions, provides simple and challenging goals, occurs in a low-threat environment, and uses technology.
4. The aim of feedback is to reduce the discrepancy between what is understood and what is expected to be understood.
5. Feedback without proper instructional design is of little use because there is no initial learning.
6. There are three major questions (i.e., Where am I going? How am I doing? Where to next?) that can be used as a guide to help teachers and learners deliver effective feedback.
7. To be effective, feedback should be delivered at an appropriate level.
8. Assessment or testing should be used as a potent feedback tool to augment teaching and learning.
9. To provide and receive feedback effectively, teachers and learners require proper training.
10. A culture that values feedback should be instilled in every teacher and learner.

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