



## Feedback in Higher Education: An Overview of Reviews and Systematic Reviews

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### Abstract

**Background:** This study aims to summarize the existing literature on the use of feedback in higher education and the associated characteristics, tools, and models.

**Materials and Methods:** Databases PubMed, ERIC, Web of Science, CINAHL, Scopus, CIVILICA, and Google Scholar were searched for relevant literature up to March 2023.

**Results:** Feedback is an essential component of the learning process. The effectiveness of feedback relates to its double-barreled approach that focuses on both the cognitive and motivational aspects of learning. Based on the literature, feedback can enhance learning professionalism, curriculum reforms, system support, student comfort, evaluations, and efficacy of professionalism. Characteristics of effective feedback include the creation of a receptive environment, clarity, and focus on direct observation, specificity, and comparison with a standard of competency, timeliness, constructiveness, encouragement of self-directed learning, and being nonjudgmental and actionable. Feedback tools (e.g., Mini-PAT, Video recording, OSCE, feedback cards, web-based) are recommended to increase learner satisfaction and the volume of feedback, but the use of tools must be combined with faculty development and feedback culture. The six most common feedback models are the feedback sandwich, the Pendleton rules, the one-minute preceptor, the SET-GO model, the R2C2, and the ALOBA model. Educators and learners need to be properly trained and empowered in this skill for the most effective and successful results in improving learning and performance.

**Conclusion:** Feedback is critical for learners' development, and educators play a crucial role in planning and providing constructive feedback. Educators should consider the quality of feedback and its models, tools, and practices and incorporate them into practice, reflecting on their performance and seeking feedback on their skills from learners, peers, and trusted colleagues.

**Key Words:** Characteristics, Education, Feedback, Models, Tools.

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## 1- INTRODUCTION

Learners usually do not know what they have to learn at the beginning and do not possess the necessary skills to evaluate their progress. Therefore, criticizing the performance and providing feedback by the trainer is an essential part of learning, especially for beginners. Instructor feedback provides students with criteria to evaluate their performance and compare their self-evaluations with those of their professors (1). Feedback is an objective, informed, and non-judgmental criticism of the learners' performance to improve their clinical skills and is done in two ways: reinforcing and correcting (2, 3).

In education and learning, feedback is a message presented to the recipient by an agent (teacher, peer, book, and the individual's own experiences and rethinking) regarding aspects of performance. Feedback in education is not only a skill but a part of the teaching and learning process (4). Experts believe that an effective coach should provide regular and continuous feedback (5). The role of feedback in higher education has been investigated in various studies. Some studies show that the views of faculty members and students on providing feedback in education differ. The study by Fakhari & Haghani (2014) showed that according to professors, 80% of practical training of clinical skills were taught by giving feedback to students, while less than 17% of students found the feedback effective (6). In the study of Hewson et al. (2012), only 8% of students were satisfied with providing feedback, and 80% stated that they did not receive any (7).

Din Mohammadi et al. (2010) found that medical educators repeatedly claimed to provide feedback to students, while the students reported the opposite (8). Some studies have also shown the lack of proper, sufficient, and planned feedback from the trainers (5, 9). Ahmady et al. (2015) reported that providing immediate and

planned feedback to nursing students during internship has succeeded in directing the path of clinical education in the right direction and increasing their skills (10). A review study by Goli et al. showed that students and professors agreed on the importance of feedback (11).

Johnson et al. (2016) aimed at determining the effect of feedback on the performance of cardiac massage in cardiopulmonary resuscitation by emergency nurses. They concluded that feedback could increase the skill of nurses in performing cardiac massage (12). According to Ende, without providing feedback, mistakes will not be corrected, correct clinical performance will not be strengthened, and clinical competencies are either acquired experimentally or not learned at all (13).

Glover (2000) showed that feedback can increase the quality of students' performance and create a sense of self-confidence and competence in them, especially if it is presented on time (14). Embo et al. investigated the attitude of midwifery students towards feedback and evaluated this new tool to support self-directed learning in clinical practice. They showed that the majority of students agreed with giving feedback, and feedback is a valuable tool for evaluating student performance in clinical education (15).

Studies on the advantages and challenges of feedback have mentioned the positive effects of feedback in deepening learning, motivation and self-confidence, self-controlled learning, the ability to apply what has been learned, and developing performance and diagnostic skills as advantages. Challenges include the fear of damaging the teacher-student relationship, the fear of negative evaluation, the teacher's concern about the feedback effect on the student, the student's adverse reactions to feedback (e.g., anger, self-defense, and embarrassment) (5, 6, 8, 16-24). A challenge facing academic staff in higher education is the need to appreciate

and understand the diverse abilities of the students. Despite feedback importance, most trainees feel that they do not receive adequate feedback, and if they do, the process is not effective. It has been shown in numerous research that providing feedback improves performance if it is presented correctly and with appropriate information. Therefore, in addition to emphasizing the importance of feedback, it is necessary to teach the correct principles of feedback providing and its models and tools to the trainers. Incorrect or inappropriate feedback has worse consequences than not providing any (1, 5). A thorough understanding of the characteristics, models, and history of feedback is essential to use in developing higher education. The present study aimed to summarize the existing reviews and systematic reviews on the use of feedback in higher education and its characteristics, tools, and models for providing feedback to students.

## **2- MATERIALS AND METHODS**

### **2-1. Data sources**

A systemic search of electronic databases Medline (via PubMed), Scopus, Web of Science, CINAHL, ERIC, CIVILICA, and Google Scholar search engine was performed with no time limit up to March 2023. The following keywords were used alone or in combination: “Feedback, Education, Students, Educators, Models, Tools, and Characteristics.” The studies were written in English or Persian.

### **2.2. Inclusion and exclusion criteria**

This overview included reviews (scoping, narrative, and rapid reviews), and systematic reviews (with or without meta-analysis) that (i) focused specifically on feedback and the mechanisms of the feedback process that influence learning, (ii) considered feedback as an element of formative assessment, and (iii) focused on

conceptualizing feedback, e.g., developing a model for how feedback impacts learning or developing a tool for feedback evaluation.

### **2-3. Study selection**

The database search was done for possible studies, abstracts of the studies were screened for identification of eligible studies, full-text articles were obtained and assessed, and a final list of included studies was made. This process was done independently and in duplication by two reviewers, and any disagreement was resolved by the superior reviewer. References were organized and managed using EndNote software (version X8).

## **3-RESULTS**

A total of 28 studies (consisting of 21 reviews and seven systematic reviews published from 1983 to 2023) were selected. The combined literature of included studies indicated many advantages of using feedback in higher education for students and educators. The main characteristics of the selected studies are summarized in the following:

- 1.** A narrative review (2023) aimed to examine the role of feedback in supporting underperforming trainees in clinical environments. The results showed that feedback literacy might help engage trainees with feedback and take an active (autonomous) role in developing their evaluative judgment. A key mechanism running through all these considerations of feedback is enabling internal motivation and creating conditions for trainees to feel relatedness, competence, and autonomy. Broadening the perceptions of feedback beyond telling can help create environments for learning to flourish (25).
- 2.** A review (2023) aimed to investigate feedback on professionalism in clinical education. The results classified the data into four categories: feedback techniques, feedback in curriculum, the scope of

feedback, and feedback outcome. Feedback on professionalism was mostly presented through online services, portfolios, video-based systems, a preceptor or peers, longitudinally in internship courses, and multi-source feedback (360 degrees). Based on the literature, feedback can enhance learning professionalism, curriculum reforms, system support, student comfort, evaluations, and efficacy of professionalism (26).

**3.** A review (2023) was conducted to provide recommendations on the use of feedback, with a focus on giving and receiving feedback, and suggestions for fostering a positive feedback culture. The results showed that feedback is integral to professional development and should incorporate learner self-assessment. The best practice recommendations are as follows: feedback should be clear, specific, timely, and actionable; feedback should be based on observed behaviors; corrective and reinforcing feedback should both be provided to learners, although not necessarily at the same time; feedback tools (e.g., Mini-PAT, TAB, and OSCE) are recommended to increase learner satisfaction and volume of feedback; however, the use of tools must be combined with faculty development and a culture of feedback to improve its quality. Based on the literature, the learning culture and type of clinical environment influence learners' feedback behaviors, such as recognizing, seeking, implementing feedback, and whether this process is encouraged. Best practice recommendations in this terms include: encouraging learners to take an active role in the feedback process; taking the work environment into account when creating appropriate feedback systems that are contextually appropriate as a way to improve the learner's perception of feedback; providing opportunities for learners to build longitudinal trusting

relationships to promote a strong educational alliance and a growth mindset and to facilitate feedback reception; addressing the tension between assessment and feedback as fear of consequences can predispose a learner to have a fixed mindset, thus limiting learner growth; and developing and maintaining standardized, structured, multisource, and longitudinal feedback processes (27).

**4.** A systematic review (of 14 studies, 2023) aimed to evaluate studies that measured written feedback quality in medicine. The results showed that improving the quality of written feedback for students in the field of medicine will improve student performance. Also, ten determinants were identified for assessing feedback. This study suggests that good quality written feedback should be specific, balanced, and constructive in nature and should describe the gap in student learning as well as observed behavioral actions in the exams (28).

**5.** A systematic review (of 68 studies, 2023) aimed to consider the different forms of educational practices that are framed about feedforward. An iterative meta-ethnographic approach to analysis resulted in the identification of five main practices framed as feedforward. These were: alignment and timing (41%), use (25%), comments (18%), self-review (9%), and teaching (7%). The vast majority involved a process where student improvement was a key goal, but the design of this process differed between practices. A large proportion supported improvement from one task to the next, almost exclusively within the 'future horizon' of the module/study unit, while only a small proportion of articles focused on improving the amount, nature, or quality of the information delivered to learners. Evidence of student sense-making and uptake was rarely sought, and few practices offered genuine opportunities for student agency, self-

regulation, and the development of evaluative judgment (29).

**6.** A review (2022) aimed to investigate the role of feedback in medical education. The results showed that, unlike evaluation, feedback presents information without judgment. Feedback is always formative. It is not an aim in itself but an instrument to inform the student about the process of learning and facilitate the necessary changes. Structured and centered learning feedback is characterized by student self-reflection, learner-centered, previous preparation, and a confident relationship between tutor and student (30).

**7.** A review (2022) aimed to explore models in clinical settings and assess their transferability to different clinical feedback encounters. The results showed that based on the literature, the most common and accepted feedback models included the feedback sandwich, Pendleton rules, the one-minute preceptor, the SET-GO model, the R2C2 (rapport/reaction/content/coach), and the ALOBA (agenda-led outcome-based analysis) model. Giving feedback is critical for learners' development, and educators play a crucial role in planning and providing constructive feedback encounters. Clinical educators should consider these feedback models and practices and incorporate them into practice, reflecting on their performance and seeking feedback on their feedback skills from learners, peers, and trusted colleagues (31).

**8.** A systematic review (of 51 studies, 2022) aimed to examine the empirical evidence of models and guidance for providing effective feedback in clinical supervision in postgraduate medical education contexts and to identify the common and differentiating components of models. The results showed that a general agreement exists in the literature about the principles of effective and ineffective feedback. There is limited empirical

evidence to support specific models and guidance for providing effective feedback in clinical supervision in postgraduate medical education. However, some evidence exists for all of the commonly identified principles for providing effective feedback. Further research in the multifaceted and complex field of effective feedback is needed, including exploring optimal measures of effective feedback that combine behavioral change with an evaluation of the perspectives of supervisees (32).

**9.** A review (2021) aimed to examine the most prominent models and theories using a systematic, three-step approach. The results showed that the 14 studied models differ in aims and focus, in choosing the "right" model, theory, typologies, and focus on feedback receptivity and require more empirical evidence, an output of the feedback effects, and more models. Also, although researchers agree that feedback is essential for improved performance and can enhance achievements on the task (reported effect sizes are as high as 0.73), however, 1) learners often dread and dismiss it, and 2) the effectiveness of feedback varies depending on the specific characteristics of feedback messages that learners receive (33).

**10.** A systematic review (of 22 studies, 2021) aimed to explore and synthesize factors that influence learners' perceptions of credibility when feedback is provided by an authority figure in a healthcare environment. Based on the evidence, four main themes were identified: feedback characteristics, context of feedback, source credibility, and recipient characteristics. Feedback delivery is vital to undergraduate and post-graduate medical education. As programs implement major educational change initiatives to create more formative assessment practices, feedback will become more crucial (34).

**11.** A systematic review (of 23 studies, 2021) aimed to systematically examine the

effectiveness of feedback on students' skill learning during PE classes and summarize the evidence for the effects of feedback elements (i.e., format and content). The results showed that strong evidence exists on the effectiveness of feedback intervention on students' skill learning compared with those who received no feedback. Limited evidence was found for the effect of visual feedback compared with verbal feedback. There were mixed results for the effectiveness of information feedback compared with praise or corrective feedback. Conclusively, current evidence suggests that feedback is useful for skill learning during PE classes (35).

**12.** A review (2020) aimed to investigate the effect of feedback in medical education. The results showed that characteristics, conventions, and recommendations for feedback delivery have been emphasized over the years in the literature available, but new approaches highlight the need to evaluate feedback with a greater focus on the social interaction involved and its actual impact on the learning process of students. Modern competency-based medical programs, with stakeholders, staff members, and educators, require a serious commitment towards their proper implementation through robust frameworks and monitoring systems designed according to every institution's particular needs. Preceptors and students need to be properly trained and empowered in this skill for optimal results in improving learning and performance. This effort is fundamental for trainees to acquire clinical competence according to defined standards, guarantees preparedness to work in unsupervised practice, and ensures patient welfare (36).

**13.** A review (2020) aimed to describe the role of feedback within the learning process, the barriers to feedback, and practical guidelines for facilitating feedback. The results showed that

feedback is an essential component of the learning process and an integral part of the curriculum. No single feedback model can work across all clinical contexts, and each clinical educator should engage in the process of feedback and use the opportunity to develop their own best practice. Regular and effective feedback helps reinforce good practice and motivate the learner toward the desired outcome. As skills in giving and receiving feedback are rarely taught to health professional students, they are often lacking in clinicians. Learners and teachers alike should understand the purpose and structure of feedback to increase the efficacy of the educational process (37).

**14.** A review (2020) aimed to identify the capabilities of formative assessment and effective feedback in medical education. The results showed that formative assessment has positive results on learning and by providing effective feedback, makes a significant difference in the quality of the teaching and learning process. In fact, effective feedback is the link between formative assessment and learning and is one of the most important elements in learners' evaluation that leads to the function of assessment as a tool for learning (38).

**15.** A review (2017) aimed to investigate feedback in midwifery education. The results showed that students and faculty members had a positive view of giving feedback. The advantages of feedback in midwifery education include the stimulation of reflection, elimination of deficiencies, personal growth, increased problem-solving skills, and group discussion (11).

**16.** A review (of 54 papers, 2017) aimed to critically appraise the medical education literature on feedback and highlight influential papers that inform the current understanding of the role of feedback in medical education. The results found three categories for feedback in medical

education: 1) learner characteristics (self-assessment is a critical factor in generating learning goals. The level of learner confidence and fear of the recipient not appearing knowledgeable are important factors in learner receptivity to and incorporation of feedback; 2) feedback characteristics (feedback delivery should remain a focus for faculty development. Feedback skills may be improved with dedicated training and spaced education. Faculty development curricula should also include education regarding the factors that impact learner receptivity and incorporation of feedback); and 3) feedback culture (specificity, timeliness, actionability, and credibility are critical components to effective feedback encounters, but culture impacts these factors) (39).

**17.** A review (2016) aimed to describe effective feedback in the education of health professionals. The results showed that feedback is an important aspect of almost all learning theories. The effectiveness of feedback is related to its double-barreled approach that focuses on the cognitive and motivational aspects of learning alike. Feedback should be related to progression toward competency to promote self-motivated learning. The tone and perceived intention of feedback affect how a learner incorporates such information. Descriptive feedback on the performance of tasks is the most beneficial. Characteristics of effective feedback include creating a receptive environment, focus on behaviors, specificity, and comparison with a standard of competency, timeliness, ensuring an appropriate, non-overwhelming amount, and encouraging self-directed learning. Interventions for the improvement of faculty competence in providing appropriate feedback are crucial for learning. Creating environments receptive to constructive, formative assessment can play a major role in

changing the focus of biomedical training from outcomes to the educational process and progression of the learner (40).

**18.** A review (2016) aimed to investigate the principles, effective characteristics, strategies, and models of feedback. The results showed that feedback should be one of the most important tenets of clinical education as an agent for reflection and improvement. Feedback can be effective when it is intended as a specific stage in education, and its principles and characteristics are considered and presented with appropriate strategies and models. If feedback is provided in an appropriate manner and with suitable information, the performance of the learner can be improved. In addition, constructive and meaningful feedback is an essential part of teaching and learning for students to get instrumental information. Thus, teachers and clinical educators must receive adequate training on feedback. Familiarity with models and strategies of feedback can pave the way toward providing effective and constructive feedback (41).

**19.** A review examined the nature of assessment feedback in Higher Education (HE) from 2000 to 2012. The results showed that the impact of EAF interventions on student performance was highly variable. Some studies reported enhanced student learning outcomes. In others, significant numbers of students did not engage or pay any attention to feedback delivered via E-assessment feedback (EAF). The thematic analysis of self-assessment feedback literature as part of the overall review revealed six key themes: 1) self-regulation support strategies need ongoing development; 2) the development of self-assessment skills requires appropriate scaffolding, with the lecturer working with the student as part of co-regulation; 3) although all students, regardless of background, need support in developing certain dimensions of self-

regulation, some need more assistance than others; 4) students' perceptions of the value of self-assessment and previous experiences of managing this are important; 5) much is predicated on the value of collaborative learning and peer support in promoting self-regulatory practice from a socio-constructivist perspective; and 6) those reportedly successful approaches to enhancing self-regulatory practice focus on student responsibility and ways of generating genuine involvement in the feedback process. Peer feedback can also be a positive experience for students, leading to enhanced performance. The authentic use of peer assessment feedback is stressed within the literature, but few studies explain in detail the nature of the intervention and considerations to ensure authenticity. The use of peer feedback in the summative marking of works is contentious and an area where academics need to tread carefully in their decisions on how to use participative assessment (42).

**20.** A systematic review (of 15 studies, 2012) aimed to elucidate the impact of feedback on the effectiveness of workplace-based assessment (WBA) in postgraduate medical training. The study population consisted of doctors in various training grades from a wide range of specialties, including general practice, general medicine, general surgery, dermatology, pediatrics, and anesthesia. The results showed that the relationship between feedback and outcome is not always straightforward and may not always achieve the desired results. Good feedback can increase motivation and confidence in trainees. Negative feedback is not meant to demotivate or demoralize a trainee but should be taken as constructive criticism to improve. More studies are required to provide evidence for the effect of feedback from WBAs on subsequent performance, as the evidence base contains few high-quality conclusive studies. There

is, however, good evidence that well-implemented feedback from WBAs, particularly MSF, leads to a perceived positive effect on practice (43).

**21.** A review (2011) aimed to investigate the definition and purpose of feedback, selectively review the literature on educators' and learners' attitudes toward feedback and provide an algorithm for giving feedback. The results showed that all existing literature reflect that the central purpose of feedback is to identify and convey the strengths and weaknesses of the learner's performance, not the learner, and is a constructive process designed to achieve ongoing elevation in the learner's practice. Feedback is a core element of medical education and is gaining emphasis but has a thin evidence base to guide medical educators. Some of the original precepts identified by Ende over the past 25 years have been supported by studies over time. These include: feedback is the most effective when there is an appropriate setting and interpersonal climate; when it includes mutually agreed-upon goals; when it is manageable in scope; when it focuses on directly observed behaviors; when it is conveyed in nonjudgmental language; and when it entails opportunities for learners to self-reflect (44).

**22.** A review in Pakistan (2010) aimed to describe and evaluate constructive feedback and its standards and identify a suitable model for constructive feedback. The results showed that providing constructive feedback to medical students and tutors facilitated teaching and learning. Through constructive feedback awareness, learning is facilitated by collecting information about students, identifying the areas for further study or additional practice, encouraging students to increase their efforts, and suggesting different learning activities, tools, and study techniques (45).

**23.** A review (2010) aimed to describe the effect of feedback in professional health



education. The results showed that facilitative (rather than directive) feedback enhanced learning for high-achievers. High-achieving recipients undertaking complex tasks may benefit from delayed feedback as such learners are supported by reducing interruptions during the task. Feedback should focus on the task rather than the individual and should be specific. It should be directly linked to personal goals. Self-assessment as a means to identify personal learning requirements has no theoretical basis. Motivated recipients benefit from challenging facilitated feedback from external sources (46).

**24.** A review (2009) aimed to describe the role of effective feedback in modern postgraduate medical education in the UK with an emphasis on competency-based curricula and workplace-based assessment. The results showed that feedback is not new to medical education and has been found effective in creating positive changes, particularly in clinical performance. By giving good feedback, the supervisor or trainer helps the trainee change for the better. Feedback is a powerful instrument that, if used wisely and well, can further a trainee's personal and professional development. The ability to give feedback is a core skill for trainers, underlying the need to include feedback skills in basic training for trainers (47).

**25.** A study (2007) aimed to review recent literature on feedback in medical education and provide the components for a practical and effective approach. The results showed that formative feedback is an essential component of effective teaching and learning. Formative feedback should be an interactive activity between the teacher and the learner. Also, feedback must be approached with mutual respect and be provided in a safe environment. Quality feedback is timely, specific to the situation, constructive, based on direct observation, and nonjudgmental. With effective feedback, learners (and teachers)

can discover what to improve and which behaviors and skills to reinforce and augment. Learners appreciate and request specific feedback, and learners tend to rate teachers who provide feedback more highly than those who do not provide feedback. Also, effective feedback reinforces good practice and has a motivating effect on the learner. Corrective feedback encourages learners to modify their behavior to achieve a more desirable result. Quality feedback depends on clear expectations from the learner, effective communication, and documentation of the encounter. By understanding the purpose and structure involved in a feedback encounter, this important part of the educational process can become more effective, efficient, and comfortable for all involved (48).

**26.** A review (2007) aimed to provide a conceptual analysis of feedback and examine the evidence related to its impact on learning and achievement. The results showed that although feedback is among the major influences, its type and the way it is given can be differentially effective. Feedback is among the most critical influences on student learning. The model proposed in this article identifies three major feedback questions: "Where am I going?" "How am I going?" and, "Where to next?" The answers to these questions enhance learning when there is a discrepancy between what is understood and what is aimed to be understood. A major aim of the educative process is to assist in identifying these gaps ("How am I going?" relative to "Where am I going?") and to provide remediation in the form of alternative or other steps ("Where to next?") (49).

**27.** A review from 1995 to 2006 aimed to propose a consensual, research-based, operational definition of feedback in clinical education. The results showed that in most medical education and social science literature, feedback is usually

conceptualized as information only. A comparison of feedback definitions in medical education revealed at least nine different features (including the content of the conveyed information, the aim of the feedback, the recipient, form of the communicated information, preparation, and source of the information, feedback provider, communication conditions, and contextual factors). Feedback is “specific information about the comparison between a trainee’s observed performance and a standard with the intent to improve the trainee’s performance” (50).

**28.** A systematic review (of 85 studies, 2006) aimed to assess the impacts of feedback on clinical performance. The results showed that the positive feedback effect among inexperienced students can be more apparent than experienced practitioners (51).

**29.** A review (1983) aimed to provide teachers and students of clinical medicine with an understanding of the feedback process and practical guidelines for offering feedback as a part of clinical medical education. The results showed that feedback in clinical medicine is necessary and valuable and becomes less difficult than expected after practice and planning. It is important to place feedback in a proper perspective within the total process of learning clinical skills. Also, feedback should not be a goal of any program; the goal should be improving clinical skills (52).

#### **4- DISCUSSION**

This overview aimed to summarize the existing literature of reviews and systematic reviews on the use of feedback in higher education and its characteristics, tools, and models for providing feedback to students. The results showed that giving feedback is critical for learners’ development, and educators play a crucial role in planning and providing constructive feedback encounters. Based on the

literature, characteristics of effective feedback include the creation of a receptive environment, clarity, focus on direct observation, specificity, comparison to a standard of competency, timeliness, constructiveness, being actionable, encouragement of self-directed learning, and being nonjudgmental. Feedback tools (e.g., Mini-PAT, Video recording, OSCE, feedback cards, and web-based) are recommended to increase learner satisfaction and volume of feedback. However, the use of tools must be combined with faculty development and a culture of feedback to improve its quality. Based on the literature, the six most common feedback models are the feedback sandwich, Pendleton rules, the one-minute preceptor, the SET-GO model, the R2C2, and the ALOBA model. Educators and students need to be properly trained and empowered in this skill for the most effective and successful results in improving learning and performance.

##### **4-1. Characteristics of Effective Feedback**

Feedback has been a topic of study for decades. Many authors have presented their ideas on effective feedback with multiple definitions developed in the literature (53). The definition of feedback in the Merriam-Webster dictionary is “the transmission of evaluative or corrective information about an action, event, or process to the original or controlling source” or “the return to the input of a part of the output of a machine, system, or process”. The definition has acquired a more specific meaning in education, specifically medical education (54), where feedback is defined as “specific information about the comparison between trainees’ observed performance and a standard, given with the intent to improve the trainees’ performance” (55). Henderson et al. (2019) define feedback as ‘processes where the learner makes sense of performance-relevant information to

promote their learning' (56). Two features of this definition are of note. First, the learner is positioned as the primary agent of the process. Second, there is no prescription in terms of where the 'performance-relevant information' comes from; the source could be a teacher, a peer, or even the learner. Recent conceptualizations of feedback have placed emphasis not on teacher inputs but on internal feedback, such as that generated by making comparisons between one's own work and the work of others (57). An important issue with providing feedback is that a suitable strategy should be chosen for providing feedback according to the educational situation. The strategies for providing feedback are different.

Dimensions that cause differences in feedback strategies include the method of providing feedback, the content of feedback, the time of providing feedback, the audience of feedback, and the amount of feedback. A way of providing feedback is verbal. Lack of opportunity and enough time is one of the reasons why a trainer or professor gives verbal feedback. Also, the need for explanations and the large volume of information to justify the learner is another reason that requires oral feedback.

If there is enough possibility and opportunity, the trainer can provide feedback in written form and even use a feedback card, which will be highly effective. In some cases, it is not possible to provide feedback either verbally or in writing. In such cases, it is necessary to provide feedback in a dramatic/ visual way. In the clinical environment, teaching the correct way to perform a clinical procedure by an instructor following the incorrect performance of that procedure by a student can be considered as providing feedback in a dramatic/visual way. The learner can use these comments to improve their work. By providing feedback, student participation in the learning process is

facilitated. Receiving feedback strengthens the learning experience and learners' motivation and reduces the gap between actual and desired performance. Appropriate feedback informs the learner of their progress and learning needs to improve their performance (41, 57).

Feedback should help the learner answer the following three questions:

- What do I want to achieve?
- How far have I progressed?
- What should I do next?

In higher education, knowing this information about an individual's performance is not enough for effective feedback, and the existence of motivation and the opportunity to understand the opinions and apply them to improve performance is also necessary (3). According to the available evidence, providing feedback is important for teachers and learners alike.

#### **A. Importance for students**

- Feedback is like a mirror in which a person observes their performance.
- Feedback reminds the learner of the need to adjust behaviors to achieve a goal.
- By receiving feedback, the learner distinguishes between favorable and unfavorable performance.
- Without feedback, the person assumes that their performance is good.

Without receiving feedback, the learner will rely only on the results of self-evaluation of their performance (58-61).

#### **B. Importance for educators**

- One of the abilities of effective professors is to provide feedback.

- Professors invest in their professional development by providing effective feedback.
- Providing effective feedback helps the teacher show their passion for empowering the learners and feel more satisfied with themselves.
- Receiving feedback from learners and other sources is also helpful for the teacher's improvement (61-63).

Currently, feedback is considered a complex concept and is defined as a complex system with three orientations (64).

### **1. Feed up**

The first component of the feedback system is that the educational goals are clearly defined, measurable, and achievable. The educator and learner should know from the beginning what learning abilities they should achieve at the end of the training. These goals are useful for students to self-evaluate and give feedback to themselves and also help the teacher in giving assignments and feedback.

### **2. Feed back**

It is the same conventional understanding of feedback, referring to the feedback that the instructor provides to the learner during training. This type of feedback is about how to reach educational goals. This feedback helps the learner to improve their performance.

### **3. Feed forward**

In this type of feedback, the data obtained from the learners' performance is used as a needs assessment to adjust the educational methods in their next training courses or units. This type of use of feedback is often neglected in the educational system. Based on the information from the provided feedback, the teachers modify their curriculum or teaching method for the

learners. The requirement of this feedback is that the curriculum is flexible, and the teacher is not considered the only provider of specific subjects. Feedback is one of the most powerful learning processes. However, it can also be a cause of anxiety for students and wasted efforts by educators (65-67). Educators often aim to provide trainees with high-quality feedback, but sadly, students often receive poor-quality, inconsistent, or insufficient feedback (68). There is another difference between the amount of feedback that students think they are receiving and the quality of feedback that educators feel they are offering (69). Although students respect and want good feedback (70), they do not find the feedback beneficial (71) as it is too vague (72), without clear outcomes and guidance on how to change, and they do not understand or misinterpret it (73). Other highlighted reasons are that feedback is given too late and is, therefore, no longer relevant. In addition, the emphasis placed only on students' grades or marks generally relates to students' ability rather than a more specific description of their individual pieces of work, with poor grades known to damage their self-efficacy (74).

Higher education is faced with a feedback problem as to why the theoretical potential of feedback and its actual reality vary. Therefore, both sides of the feedback question (i.e., tutor provision and student use) are challenging. Besides poor quality or missing feedback in most situations, existing feedback strategies fail despite the argument that feedback on learning is successful (75). In addition, students' failure to take note of feedback often discourages lecturers from giving feedback. Therefore, knowing why students do not always use feedback is crucial (76). Taking a broader overview, Jonsson (2013) identified five reasons why students might not use feedback in different circumstances: 1) it may not be

useful; 2) it may not be sufficiently individualized; 3) it may be too authoritative; 4) students may lack strategies for using feedback; and 5) students may not understand the terminology used (77). It has been proven in extensive research and studies that providing correct feedback with appropriate information is a factor that improves performance (62). Therefore, in addition to emphasizing the importance of providing feedback, it is necessary to teach the correct principles of providing feedback to teachers and trainers, as providing incorrect feedback will have more inappropriate consequences than not providing feedback. In various evidence, a total of 14 key principles have been proposed as standards for correct feedback as follows:

1. Well-timed and expected (as early as possible and agreed between participants for their common goal(s));
2. Based on first-hand data (without any intermediate source and through direct observation);
3. Confidential (to maintain trust and respect);
4. Quantity regulated (a reasonable amount of information);
5. Balanced (appreciation for good things and suggestions for improvement);
6. Clear (in terms of goals, criteria, and standards);
7. Encouraging (for the time, effort, and positive beliefs, i.e., encouragement for whatever is right or good and interaction and dialogues with peers and teachers);
8. Helpful (for teaching and learning activities, i.e., helpful in improving teaching and achieving common academic goals);
9. Opportunistic (with opportunities for raising current performance to meet standard performance);

**10.** Purposeful (e.g., to plan a strategy, to improve results, and to clarify standards);

**11.** Relevant and tailored (according to the needs and interests of an individual);

**12.** Factual (based on actual performance rather than assumptions or interpretations);

**13.** Descriptive (non-evaluative); and

**14.** Specific (focusing on the observed and changeable behavior) (45).

Answering the following four questions on a regular basis will help provide quality student feedback (78-80).

- What can the student do?
- What the student cannot do?
- How does the student's work compare with others?
- How can the student do better?

However, Schartel (2012) warns of the danger of too much feedback, especially if negative, which may overwhelm the learner, and advocates the use of neutral, non-judgmental language. This feeds into the phenomenon of students engaging in all-or-nothing thinking, where they either think their work is sufficient and they do not need to do anything to improve, or they are disappointed with the outcome and believe it was all a waste of time because it is of no value (68).

#### **4-2. Feedback Models**

Within the teaching and learning process, it is helpful for the clinical educator to explore several feedback models and techniques described in the literature to apply in clinical settings and analyze the transferability to their educational practice in macro or micro-feedback encounters. Some of the most common and accepted feedback models are the feedback sandwich, the Pendleton rules, the one-minute preceptor, the SET-GO model, the R2C2, and the ALOBA model. These six models have similarities and differences in

structure and objectives for the feedback encounter, from the simplest and most educator-centered (e.g., feedback sandwich) to the most complex and learner-centered models (e.g., ALOBA). Several aspects must be considered as part of the decision-making process when choosing the ideal model for a feedback encounter (81). The six common models have been introduced in scientific texts to systematize and help professors in providing effective feedback as follows:

#### **4-2-1. Feedback Sandwich**

The feedback sandwich receives its name as it contains two doses of positive/reinforcement feedback and one dose of critical/corrective feedback sandwiched between them to make the model more palatable and acceptable. It is a brief and highly structured model that requires low levels of feedback-giving expertise by the educator and low reflection and self-assessment skills by the learner, making it suitable for inexperienced educators and applicable in various feedback encounters. Its weakness lies in that it is educator-centered and a one-way transmission of information with no input from the learner.

#### **4-2-2. Pendleton Rules**

Pendleton rules are a modification of the feedback sandwich, where the educator's comments are preceded by the learner's reflections on what was good about their performance and what were the areas for improvement. This model represents a structured and rigid dialogue that is less educator-centered than the feedback sandwich, appropriate to initiate learners on reflective practice and self-assessment skills, and suitable for educators with low feedback-giving expertise. Its limitations are due to the inflexibility of the conversation and the anticipation of critical feedback. Although it is applicable in various situations, it is mainly

recommended for macro-feedback encounters.

#### **4-2-3. One-Minute Preceptor Model**

One-minute preceptor model, also known as the five-step "micro-skills" model, is particularly useful in micro-feedback encounters and busy clinical settings. It provides a brief and straightforward framework for teaching and giving feedback during patient care. The educator first receives a commitment from the learner on a specific aspect, such as the diagnosis or treatment plan, then probes for supporting evidence exploring the learners' rationale, teaching general rules if necessary, and finally establishes a brief discussion reinforcing the positive aspects and correcting mistakes. This just-in-time feedback model facilitates the development of clinical reasoning and decision-making skills, preferably individually, requiring medium feedback-giving expertise from the educator to explore a single aspect and provide balanced feedback and medium learner reflection and self-assessment skills.

#### **4-2-4. SET-GO Model**

The SET-GO model aids memory for the sequence and is beneficial when giving feedback in group encounters. It is based on descriptive and non-judgmental feedback, where the educator asks the observed learner or group to describe what they saw, further explores and contributes to these observations, and then refers back to the learner for possible solutions and reflections. The group then establishes the goals to achieve and offers suggestions on how to accomplish those objectives, which might include developing skills or rehearsing. This model encourages peer feedback, establishes a dialogue, and facilitates vicarious learning through the experience of others. The downsides are that it requires time for everybody to contribute, learners themselves need to develop feedback skills, and the educator

requires medium to high expertise to provide feedback and manage the group dynamics.

#### **4-2-5. R2C2 Model**

The R2C2 model has been specifically developed to give feedback based on assessment and performance rather than daily practice or specific rotation moments. The model establishes a dialogue by exploring an assessment result, its value, and the learners' perception/reaction. The educator first builds rapport with the learner, creating a respectful and trustful climate, exploring the learners' reactions to the assessment, and stimulating reflection and self-assessment. Subsequently, the educator explores the learners' understanding of the content and results of the assessment and adopts a coaching stance, agreeing on solutions and an action plan. The R2C2 model provides a learner-centered framework that facilitates the acceptance of the assessment and the feedback received, requiring learners to look beyond the assessment result and, therefore, medium to high reflection and self-assessment skills. The educator needs high feedback-giving skills, as they must be prepared to face negative reactions and fully understand the assessment's purpose and content to be reviewed.

#### **4-2-6. ALOBA Model**

The ALOBA model aims to establish a learner-centered conversation or interview-type feedback guided by the learners' agenda and learning needs complemented by the educators' view. The learner is first asked to reflect and identify their needs and agenda for the feedback encounter. The educator then encourages self-assessment and problem-solving skills, reinforces theory-practice links, and provides balanced feedback. A discussion of suggestions and alternatives to accomplish the learner's objective and learning needs follows, and finally, the

educator checks the learner's acceptance, summarizes the encounter, and agrees on an action plan. The ALOBA model is considered an evolution of the Pendleton rules as it adds learner-centeredness and flexibility to the feedback encounter, where the learner is an active participant throughout rather than a passive recipient of suggestions. The learner requires high insight, reflection, and self-assessment skills to lead the discussion and identify their needs and agenda. The educator requires high feedback-giving skills and judgment to facilitate the conversation and provide balanced feedback and theory-practice links.

These feedback models, with their strengths and weaknesses, represent practical frameworks for clinical educators to adopt but also to adapt to their preferred style. The models may be combined and modified to suit educators' and the learners' needs, considering the context in which feedback is given, the educator's expertise, and the learner's insight, reflection, and self-assessment skills. However, irrespective of the model used, clinical educators should always consider the aspects listed below when giving feedback (31, 33, 81).

### **4-3. Feedback Tools**

When providing feedback, it is important to use a variety of techniques and tools tailored to the individual learner and situation. Feedback tools have been demonstrated to increase the number of feedback encounters and improve learner satisfaction with feedback. However, it is important to note that feedback tools are not a replacement for verbal feedback or preceptor experience (27). Based on the literature, a summary of feedback tools is provided below.

#### **4-3-1. Physical Feedback Tools:**

- Feedback cards

- Direct observation cards
- Field note tool
- Multisource feedback tools.

#### **4-3-2. Feedback E-tools:**

- Web-based
- App-based
- Online social media platforms
- Video recording.

Other useful evaluation tools include Inviting Co-workers to Evaluate Physicians Tool (INCEPT), Mini Peer Assessment Tool (Mini-PAT), Team Assessment of Behavior (TAB), Emergency Medicine Humanism Scale (EM-HS), Communication Assessment Tool (CAT), Observed Structured Teaching Exercises (OSTE), and an Objective Structured Clinical Examination (OSCE). It is important to note that each tool has strengths and weaknesses (27). Based on the existing literature, feedback tools are recommended to increase learner satisfaction and the volume of feedback. However, the use of tools must be combined with faculty development and a culture of feedback to improve its quality.

## **5- CONCLUSION**

Based on the literature, giving feedback is critical for learners' development, and educators play a crucial role in planning and providing constructive feedback encounters. Feedback is an essential component of the educational system. It can be incorporated to enhance teaching and learning techniques since it has an immediate impact on the process of acquiring knowledge and a direct impact on teaching and learning. Feedback is not an aim in itself but an instrument that informs the student on the process of learning and facilitates the necessary changes. Effective feedback is the link between formative assessment and

learning and is one of the most important elements in learners' evaluation that leads to the function of assessment as a tool for learning. The effectiveness of feedback relates to its double-barreled approach that focuses on the cognitive and motivational aspects of learning simultaneously. Characteristics of effective feedback include the creation of a receptive environment, clarity, focus on direct observation, specificity, comparison to a standard of competency, timeliness, constructiveness, being actionable, encouragement of self-directed learning, and being nonjudgmental. Feedback tools (e.g., Mini-PAT, video recording, OSCE, feedback cards, and web-based) are recommended to increase learner satisfaction and volume of feedback. However, the use of tools must be combined with faculty development and a culture of feedback. The six most common feedback models are the feedback sandwich, Pendleton rules, the one-minute preceptor, the SET-GO model, the R2C2, and the ALOBA model. Educators and students need to be properly trained and empowered in this skill for the most effective and successful results in improving learning and performance.

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