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## Enhancing physics learning through feedback: insights from secondary and high school teachers

Gabriela DOMILESCU\*, Mihaela IORGA\*\*

### Abstract

Numerous studies in the educational field show the importance of feedback in the teaching process and students' motivation for learning. Although researchers agree that feedback is essential for improved performance, learners often dismiss it, and its effectiveness is diminished because of specific characteristics of feedback itself, teacher, and learner. By employing a non-experimental transversal research design, the present study aimed to assess the implications of feedback on the achievement of middle and high school students, as perceived by the teachers, in the subject of physics. To this end, we first conducted a narrative review of the existing literature with a focus on the types of feedback, the ways of giving it, and its effectiveness, and a qualitative analysis of how feedback is implemented in the classroom and its implications for student achievement, we created an evidence-based interview grid. Afterward, we realized and gathered valuable information from 11 Romanian secondary and high school teachers. According to the results, feedback improves student achievement and can streamline teaching to meet the student's needs and channel them toward improved performance. Our paper tries to fill the gap between the existing knowledge about feedback and the actual process of teaching and learning Physics in secondary and high school. Even if our endeavour has limitations (e.g., a small number of interview participants), it provides a clearer picture of how to make the most of the feedback according to teachers. The main contribution of this paper is identifying physics teachers' perceptions of feedback and suggesting improvement proposals, by analysing current research. Also, our work offers some straightforward avenues for using feedback in physics disciplines in the Romanian context. We also advanced concrete proposals for optimizing the feedback offered to secondary and high school students in the physical discipline to help them optimize their performance.

**Keywords:** feedback, teaching physics, secondary school, high-school, interviews.

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\* PhD, Lecturer, Teacher Training Department, West University of Timisoara, [gabriela.domilescu@e-uvt.ro](mailto:gabriela.domilescu@e-uvt.ro)

\*\* Teacher, Secondary School No. 24 Timisoara, Romania, [mihaela.iorga@e-uvt.ro](mailto:mihaela.iorga@e-uvt.ro)

## 1. Introduction

Continuous feedback is a cornerstone of modern educational systems that prioritize student-centred learning. Research by Shute (2008), Lipnevich and Smith (2009), and Boud and Molloy (2013) underscores the vital role feedback plays in improving the learning process and boosting student motivation. Although feedback is essential for motivation and improved academic performance, learners often dismiss it and its effectiveness is diminished depending on specific characteristics of feedback itself, teacher, learner. Nevertheless, the literature on feedback is relatively scarce, especially in Physics.

Feedback is a fundamental element in numerous learning and instructional theories. Understanding the conditions that make feedback effective can enhance both theoretical advancements and practical teaching methods (Bangert-Drowns et al., 1991). Although, researchers (Shute, 2008) agree that feedback is an important facilitator of learning and performance, it is very important for teachers to be fully aware that feedback becomes effective only if it is provided correctly and only if it fills the gap between the current results and desired performance (Sadler, 2014).

The aim of this paper is to analyze the specificity of feedback in Physics and to offer recommendations to improve feedback effectiveness and practices in secondary and high school. So, this article is targeted at Physics and/or science teachers interested in improving their feedback practices, as well as at academics working in teacher training. Despite numerous research on feedback, to our knowledge, in the Romanian educational area there are no studies that analyse the impact of feedback in teaching Physics in secondary and high school and, even less, that addresses the optimization of feedback practices in teaching Physics. Another reason why optimizing feedback becomes relevant for teaching Physics in secondary and high school is that, lately, there is a significant shortage of Physics teachers in Romania and students' interest for this area is decreasing.

First, we discuss the importance of feedback, then, we continue by reviewing the existing literature to understand the specificity and challenges around feedback, generally, and in science (Physics), especially. The specificity of feedback may be affected by several contextual characteristics (e.g., gender, teaching experience, taught subject), this being the reason why we wanted to have the practitioners' perspective. After analyzing the physics teachers' answers to our question regarding feedback practices in secondary and high school Romanian education, we conclude by suggesting some directions for improving feedback effectiveness in teaching Physics.

## Literature Review

Even if there is not a widely agreed scholarly definition of feedback, the general understanding is that feedback is something that teachers give to students in order to help them understand the subject and progress academically. In the educational context, feedback refers to the information given to students about their performance or

understanding of a specific task or concept. If at his early days, the term feedback was perceived as something "given" after the performance of the pupil/student, its significance has evolved acquiring the meaning of a process in which the pupils play an active role. This evolution of feedback from a simple term to a concept allowed the emphasis on as many characteristics of feedback as possible (Dawson et al., 2019). Thus, while the term feedback meant originally providing *hopefully useful* comments from the teacher to students, later feedback was found to serve a variety of purposes such as: marking achievement, developing comprehension and skills, motivating students.

More recently, definitions of feedback emphasise the importance of student agency in relation to teachers input, the perspective of the student, the understanding of how students learn in order to see how teachers should best teach (Scott, 2014). The most important functions of feedback are (Molin et. all, 2020) helping students reach their learning objectives (by pointing out their strengths and recommending areas for development), sharing learning intentions, clarifying success criteria, providing feedback that helps learners progress, and actively engaging and empowering students. Moreover, the student learns much faster and more effectively when he has a clear idea of how well he is learning and what he might need to do to improve (Mag, 2019).

Nowadays, we speak about different types of feedback: written feedback, oral or conversational exchanges, grades, assessment comments, and online feedback. Hattie and Timperley (2007) provide a conceptual analysis of feedback and explore the evidence concerning its impact on learning. They conclude that while feedback is a significant factor in the teaching and learning process, its effectiveness depends on various factors, such as the type of feedback (whether positive or negative) and how it is delivered, including considerations like timing. Farquhar and Regian (1994) found that when immediate feedback is provided, elaborative feedback leads to higher accuracy compared to corrective feedback. Black and Harrison (2000) highlight key features of effective feedback, concluding that it should stimulate thinking by encouraging learners to discuss their thoughts with a teacher or peer to drive improvement. Effective feedback should prompt immediate action, connect to the success criteria, and enable learners to compare their assessment of quality with that of the teacher or peer. Additionally, it may guide learners on where to seek help and how they can enhance their work. Good feedback should incorporate several dimensions to be perceived as good: Dunworth and Sanchez (2016) state that quality feedback is a process in which teachers' inputs and support are productively used by students to improve their educational experience from several different dimensions (affective or interpersonal, orientational and transformational).

Hattie and Timperley describe feedback as information given by an agent—such as a teacher, peer, book, parent, self, or experience—that offers insights into student's knowledge. Effective feedback strongly influences assessment, but also learning and teaching. From the perspective of students, researchers (Scott, 2014) define feedback as how students can always be aware about their level in terms of the knowledge, skills and understanding in a subject.

Several studies (Ackerman & Gross, 2010, Hattie, & Timperley, 2007, Mulliner, & Tucker, 2017) demonstrate that feedback is a crucial element of the teaching-learning process, consisting of two key components: the receiver and the transmitter. To offer effective feedback, teachers have to make appropriate judgments about when and how to provide quality feedback. Feedback is a means through which the students are offered the tools that will allow the understanding of all aspects related to the learning process.

Nevertheless, research shows that learners often dismiss feedback, even if it has a strong unique influence on improving student results. Why is this happening? Possible answers relate to:

- according to Mulliner and Tucker (2017), the frequency, timing, and method of providing feedback are more important than the quality of feedback itself in supporting student learning.
- teachers provide feedback to students on the strengths and weaknesses of their work, which can often be complex and difficult for students to fully understand (Juwah et al., 2004).
- for feedback to be effective, it is crucial for the teacher to have a deep understanding of their students, including their current level of performance and where they need to progress. This knowledge allows teachers to provide targeted support to help students reach their desired level: a number of studies have shown that elaborate feedback, where students are helped to find the correct path, is much more effective than situations where they are simply told whether they are right or wrong. (Blair, & McGinty, 2013; Nicol, 2011);
- many studies indicate that the effectiveness of feedback is largely determined by the provider, who must carefully consider the content, tone, and timing to ensure the feedback process is successful (Ketonen, Nieminen, & Hähkiöniemi, 2020).

Analyzing the effectiveness of feedback in science, researchers argue the importance of a social context in constructing meanings and developing understanding in science learning (Duit & Treagust, 2008) and that much of the meaning-making occurs through classroom discussion during teacher-student interaction (Chin, 2006). Studying science teachers instructing 11–18-year-olds in science, Gioka (2006) concluded that feedback plays a formative role only when it offers information that helps bridge the gap between current performance and desired outcomes. Additionally, for feedback to be effective, teachers must provide students with time to respond to the comments given and with a comparison of their performance relative to the proposed educational objectives, with the goal of helping them reach and even exceed those objectives.

Research (Ives, 2000; Capistrano, 2002, as cited in Alcantara & Roleda, 2016) indicates that class size in Physics significantly impacts the teaching and learning process, particularly affecting the quality and timeliness of feedback. Larger class sizes make it more challenging for teachers to provide effective and timely feedback to students. Class size is a significant challenge for teachers when providing feedback. In the context of science practical work, it is unlikely that activities can be conducted both effectively and safely in classes with more than 25 students (Rennie, Goodrum, & Hackling, 2001).

Alcantara and Roleda (2016), in their analysis of fast feedback methods in teaching physics, emphasize the critical importance of teachers monitoring students' learning and providing immediate feedback. They argue that promptly informing students of their mistakes helps them learn and take corrective actions, while knowing they are performing well gives them a sense of achievement, which motivates further learning.

For teachers to offer quality feedback, it is important to believe in its usefulness and contribution to student's outcomes and to make changes in assessment practices, which come hand in hand with shifts in teachers' beliefs and approaches. There is research showing important aspects of feedback that may need to be approaches to improve students' performances in an interactive and non-judgmental manner (Pusdekar, Y., et al., 2024) because teachers may be unaware of how to give constructive and specific feedback to the student and may unintentionally provide feedback about a students' performances through nonverbal or verbal communication. Research suggests that neutral feedback offers several advantages in fostering conceptual understanding. To create a more effective inquiry-based atmosphere in a science class, it is recommended to avoid praise such as *good boy, great answer, or well done* (Goodrum, 2004 in Siddiquee & Ikeda, 2013).

### **Methodology:**

To ensure a comprehensive and relevant theoretical framework, we used a non-experimental transversal research design, combining literature analysis with semi-structured interviews. First, we analyzed several studies regarding the value of feedback in general (Hattie & Timperley, 2007, Dawson et. all, 2019, Black & Harrison, 2000, Cavalcanti et. all, 2020, Ketonen, Nieminen, & Hähkiöniemi, 2020, Panadero, Lipnevich, 2022) and relevant studies regarding feedback on Physics in secondary and high school (Tripon, 2024, Black, & Harrison, 2000, Mag, 2019), but here the literature is not so rich. Second, we used interview-based research, wherein the teacher-researcher conducted an undertaking to analyse an actual important aspect of the subject the teacher teaches: Physics. The participants of this study are 11 Romanian secondary and high school teachers (73% female, 27% male), who answered the questions of a a predetermined interview guide. We correlated the analysis of literature on feedback with practical reflections from physics classes, through a semi-structured interview because of its flexibility and the possibility of in-depth exploring participants' responses. To identify the answers to these questions, we created a semi-structured interview grid in which we investigated: assessment methods, the role of feedback, the purpose of feedback, the frequency of feedback, students' interest in feedback, levels of providing feedback in teaching Physics in secondary and high school. This approach was chosen to offer a realistic perspective by examining actual classroom practices, allowing for a detailed understanding of Physics teachers' views on feedback. Teachers voluntarily participated in the study after being thoroughly informed about its objectives and procedures.

Informed consent forms ensured that participants were aware of their rights, confidentiality measures, and the voluntary nature of their involvement.

Consequently, our research questions were:

Q1. What are the implications of feedback on student achievement in Physics?

Q2. What is the role of feedback in teaching Physics?

Q3. What are the ways of improving feedback in Physics?

## Findings

Analysing the answers teachers gave to our question, we will discuss below the most important implications for the objectives of our paper:

- all interviewed teachers mostly use traditional assessment methods (oral and written). In addition more than half also mentioned using other methods, such as: Homework, Experimental investigation, Projects, Portfolios. The most common types of assessment are: initial, formative and summative assessment.
- most teachers consider feedback as representing an appreciation, collaboration and a way of obtaining information about the effects of an action;
- teachers see feedback as very important, even essential in the educational activity, its purposes being to check how students understood the concepts and to improve teaching; moreover, feedback in education is perceived as *an adaptation tool*, its role being to enhance motivation, self-regulation and self-evaluation;
- regarding the difficulties in the case of feedback in the Physics, most teachers believe that, although feedback requires additional effort and time, offering it is simpler compared to other subjects.
- regarding the frequency of feedback in Physics, teachers offer it very often correlating it with initial, formative and summative assessments, but also whenever it is needed/ after each task. However, there were teachers who believe that feedback offered is not enough: the frequency of giving feedback is quite low because teachers do not give enough time for and do not consider it important.
- when asked to enumerate 4 essential reasons for offering feedback, teachers mentioned: to justify the grade; to help students better understand the level they are at; to improve learners' skills; to be able to self-regulate in the future activity. In an attempt to rank these reasons, we saw that each teacher considers feedback as essential for something specific. Nevertheless, most teachers believe that the role of feedback is not to justify the grade, but to help learner self-regulation and performances.
- regarding the frequency with which physics teachers discuss with their colleagues about feedback and its usefulness, teachers claim that they frequently discuss this aspect, "*whenever we have the opportunity*", but addressing feedback in intercollegiate discussions is not a planned and permanent practice. Most of the discussions take place with colleagues who are part of the same curricular area, and especially during methodical meetings.
- when discussing the role of feedback in motivating students, teachers emphasize that feedback is crucial for encouraging and inspiring students throughout the learning process.
- when asked about how they approach feedback, most of teachers stated that they have a differentiated approach depending on the specifics and particularities of the class and of

students: (*"I approach feedback differently depending on the characteristics and personality of students"; "Each class is different and requires a different approach"; "Each class has its specifics; ... depending on the class level, even depending on the student; "the classes have their own specificity; ....the feedback is different"*). Few of the teachers approach feedback is the same way regardless of the situation.

- 90% of teachers believe that students are interested in the feedback received, only one teacher specified that, generally, students are disinterested.
- to the question related to how feedback can contribute to improving student's performances in Physics, teachers consider feedback having an essential role in improving academical results by: *"enhancing students' ability to recognize correlations between observed physical phenomena and processes, increases self-esteem", "optimizes self-regulation", "enhances correct self-assessment", "encourages students to surpass their current level of knowledge and understanding"*. However, one teacher claims that feedback is only effective for students interested in obtaining good results (grades).
- there are four levels of feedback messages that focus on different aspects of students' learning: task, process, self-regulation, and self (Hattie and Timperley, 2007). When asked which of the 4 levels they address when giving feedback, most teachers stated that they are on the first level (the workload and results), followed by the second level (the learning process). Self-regulation is not often approached, and only one of the teachers considers to offer feedback on all four levels, including the level of the self.

At the end of the interview, teachers participating in the study were asked to specify what worked/didn't work when offering feedback and to give examples of good practices. Analyzing their answers, the following conclusions emerged:

- Feedback produced positive effects when given in oral assessments. There are teachers who claim that the feedback given after summative assessments was effective, although research (Giles, Gilbert, McNeill, 2013) tells us that feedback given after summative assessments is not very effective. Nevertheless, students who were very interested in Physics and in their academic results capitalize on feedback.
- Feedback was effective when used in correlation with alternative assessment methods: Portfolio, Projects and other Independent practical activities. Teachers argue that the effectiveness of this type of feedback is due to its specificity: collaborative, punctual, in real time, complete, making the moment of assessment a learning experience.
- Teachers argue feedback is effective when is given after each assessment and at short time intervals and transmitted through messages of encouragement.
- There were also situations when feedback did not work, especially in the case of online assessments during the pandemic, in certain topics that required more effort from the students to understand certain important aspects (i.e. There were also times when, regardless of the feedback and the support provided, some of the students, did not want to step out of their comfort zone, neither put in a minimum effort). Also, feedback becomes ineffective when it is formulated and given inappropriately, resulting in students misunderstanding (*"It didn't work when it wasn't correctly formulated, when it targeted the person and not the behavior, when it didn't respect autonomy, when it was focused on mistakes"*). Teachers also referred to situations encountered during their teaching careers, specifying, for example, that *"students are totally disinterested in the learning process"* or (in the case of students from rural

areas), *"feedback is not effective because learners do not have the experience to receive and capitalizing on feedback"*.

Our findings reveal that Romanian Physics teachers regard feedback as a crucial element of the educational process, promoting learning and development both within and beyond the classroom. Through semi-structured interviews, we collected rich qualitative data that shed light on the significant impact of feedback on student achievement.

Q1. What are the implications of feedback on student achievement in Physics? According to our data, feedback contributes to the improvement of the students' results by highlighting their progress in Physics and it offers students the opportunity to check their results and ask questions, enhance harmony and a continuous teacher-student dialogue, essential for improving academic performances. Studies about feedback and performance show that constructive feedback significantly impacts academic performance, improving understanding and motivation, allowing learners to self-regulate and adjust their approaches to tasks (Hattie & Timperley, 2007; Wisniewski et al., 2020) and that internal motivation and performance are increased by task-focussed comments, not global-affective comments (Koenka et. all, 2021). By receiving feedback on their progress, students become able to self-regulate their learning, become more self-confident, more motivated for future learning activities, more interested in Physics, especially, and in school performance, generally. By taking time to talk with students, giving them feedback, teachers can have a positive impact on the learning process.

Q2. What is the role of feedback in teaching Physics? Feedback not only certifies school performance, but also enhances confidence, motivation and interest. Feedback informs about the level of preparation of students, the acquired knowledge and the developed skills, but it also provides a general and punctual view of learning, facilitating the reorientation of teachers' actions to adapt to student` needs and channel them towards improving their results.

Q3. What are the ways of improving feedback in Physics? Research indicates that feedback can either greatly enhance or hinder learning, playing a crucial role in helping students achieve their goals (Hattie & Timperley, 2007). If feedback is not clearly directed, students may struggle to draw meaningful conclusions about their progress and development during the learning process and students may not know how to use feedback for optimizing their performances. The essential condition of an effective feedback is to be oriented towards the future collaborative, punctual, in real time, complete, usable, sufficiently detailed, comprehensible, and consistent.

### **Discussion:**

In line with well-known research, our data shows that feedback influences students' learning performance, having a particularly important role in improving students results



by providing additional insight into the skills that would induce improved performance. Feedback plays a crucial role in enhancing learning and performance (Bandura & Cervone, 1983), but its impact is significantly greater when it is delivered effectively. In practice, feedback does not have to be limited to delivery of information from the teacher to the student, it has a variety of purposes such as grading, developing students' understanding, skills and motivation. Feedback becomes ineffective when it is formulated and given inappropriately, causing misunderstandings on the part of students.

Although feedback is an important facilitator of learning and performance (Shute, V. J., 2008), the success of feedback depends on how it is delivered to learners: students learn more quickly and effectively when they have a clear understanding of their progress and the actions they need to take for improvement (Mag, 2019). In practice, feedback should not be limited to providing information from the teacher to the student, it has a variety of purposes such as: motivating students, increase involvement, improve self-esteem and self-regulation, optimize teacher-student relationships. Feedback becomes ineffective when it is formulated and given inappropriately, resulting in misunderstanding on the part of students. Thus, the information provided by specialized literature was confirmed (Ackerman, Gross, 2010, Hounsell, D., 2003, apud Mulliner, & Tucker, 2017), according to which feedback is an essential component of the instructional-educational process that involves two elements – the receiver and the transmitter, and the quality of feedback has a strong unique influence on improving student results and achieving school performance. According to literature (Educational Endowment Foundation, 2021) additionally, prompt and constructive feedback encourages active learning, student engagement and motivation. Collaboration between experts and teachers is essential in developing assessment methods and tasks that effectively evaluate science learning and provide meaningful feedback (Rennie, Goodrum, & Hackling, 2001). This iterative approach encourages students to actively engage in their learning, resulting in enhanced comprehension and better retention of information. Effectiveness of feedback depends on the experience and capabilities of the teacher and the students, and the nature of the science tasks undertaken. According to some research, students indicate that quizzes are frequently used to provide feedback and one-third of students report that their teacher never speaks to them about how they are going in science (Rennie, Goodrum, & Hackling, 2001).

Developing feedback literacy among both teachers and students should be a key priority. Sutton (2012) defines feedback literacy as the ability to read, interpret, and effectively utilize written feedback. Carless and Boud (2018) expand on this approach by describing it as the understanding, skills, and attitudes needed to interpret feedback and apply it to improve learning or work strategies. Feedback literacy emphasizes the critical role of students' active involvement in the feedback process. While teachers play a pivotal role in delivering feedback, its true effectiveness depends on the recipient's ability to accept, process, and act on it meaningfully.

Feedback becomes effective only if it is given and understood correctly. Feedback efficiency increases if there is a dialogue and a permanent collaboration between teachers teaching different subjects, but also between teachers and their own students. The way students value feedback is heavily influenced by how the feedback message is delivered. Recent research has increasingly explored how delivery methods influence the feedback process (Winstone et al., 2017; Jonsson & Panadero, 2018; Van der Kleij & Lipnevich, 2020). For example, Hattie has shifted his focus from analyzing feedback characteristics, as described in his model with Timperley, to examining how the presentation of feedback can more effectively help students make use of it (Hattie & Clarke, 2019).

One effective way to enhance feedback while reducing the time spent grading student work and writing detailed comments is using Fast Feedback Methods (van den Berg, 2003). These methods focus on providing meaningful formative assessments without requiring teachers to grade papers outside of class. This can be achieved by utilizing conceptual or problem-solving questions, which students can answer through various formats such as written responses, explanations, simulations, graphs, or sketches.

There is an undeniable need to develop assessment approaches that are both efficient and effective for classroom use. Collaboration between experts and teachers is essential to create assessment techniques and tasks that exemplify the best methods for evaluating science learning and delivering feedback to students (Rennie, Goodrum, & Hackling, 2001). Even if we did not approach it in the interviews, research shows that student-student-feedback is the most effective form, with respect to the direction of feedback (Wisniewski, et al., 2020).

Experts also emphasize that high-quality professional development is crucial for enhancing teachers' ability to teach effectively (Mayer, Mullens, & Moore, 2001), a principle that can also be applied to improving the quality of feedback they provide). Recent studies, including Tripon (2024), highlight the value of feedback not only in teaching Physics but also in service-learning for STEAM students. Feedback sessions enable students to critically evaluate their experiences, pinpoint areas for improvement, and refine their teaching strategies, fostering both personal and professional growth.

Starting from the consideration that feedback is essential for the development of effective learning, we conclude by specifying a few suggestions intended to improve the effectiveness of feedback in physical discipline and not only:

- to raise Physics teachers' awareness of the importance of feedback for
- development of students' skills and motivation;
- to analyse the reasons that lead teachers to invest energy and time in providing feedback;
- to create more collaborative contexts for sharing good practices regarding the use of feedback in sciences;
- to shift feedback from the level of task and results to the level of the learning process and self-regulation, but also of the self, where possible;

- to help students become accustomed to feedback and recognize its value explaining the importance and role of feedback, as well as how to receive and effectively use it;
- to particularize feedback in order to increase students' involvement in the learning process;
- to offer well timed, constructive, encouraging feedback;
- to foster open communication and provide regular, constructive feedback that engages students in the learning process is essential to encourage and create more opportunities for teacher-student interactions and dialogue around assessment and feedback;
- to present feedback in a manner that is comprehensible to students and relevant to their future work;
- to ensure that feedback is thoughtful, reflective, and focused, promoting a deeper understanding of key concepts;
- to utilize technology, multimedia resources, interactive materials, digital assessment when offering feedback;
- to provide each student with the opportunity and support to work on improvements during class, allowing the teacher sufficient time to review this within the lesson.

### **Limitations**

Among the limitations of this study, we mention the following: we approached only secondary and high school teachers from the west and the south-west of Romania, so our findings cannot be extrapolated. This paper reflects the results of a qualitative research on the implications of feedback at Physics from the perspective of teachers, it is not correlated with quantitative data, nor student perspective. Unfortunately, we have identified a few studies regarding feedback in the Physics worldwide, and we have not identified any study in this sense in Romania, so our perspective could be a limited one and with shallow comparative potential.

The following studies could extend the present by quantitative and qualitative analysis regarding the effects and implications of feedback in secondary education. It would also be interesting and valuable to know the opinions of students regarding the feedback and its usefulness. Another aspect worthy of study concerns the correlations between different ways of granting feedback and school results expressed in grades.

### **Conclusion**

The results of our research show that the feedback provided by teachers contributes to student outcomes, can refocus teaching to better meet the students' needs and to channel learning towards the learning outcomes. By correlating the results obtained with recent research, we advanced concrete proposals for optimizing feedback in physics. In our

study, we explore, through qualitative analysis, how feedback influences student growth. After analysing literature in this field and interviewing 11 secondary and high school teachers, we conclude that feedback is regarded as an essential component of student learning, its role being to facilitate learning. Feedback itself has an essential role in the learning process. The teacher's role is also essential in offering proper feedback, but, also, in designing the lessons, knowing and establishing connections with the class. Although feedback is increasingly present in the educational process, it is still necessary for physics teachers to motivate their own students more and help them develop a positive attitude towards feedback and Physics.

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