

# The Impact of Teacher Feedback on Non-cognitive Aspects of Student's Performance in Higher Education: A Review of Research

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## Abstract

Teacher feedback in higher education is an essential aspect of the teaching and learning process, as it presents the learner with objective judgments about his performance, helping his educational progress and improving his academic performance. This paper is a systematic review based on the PRISMA 2020 methodology, which identified 41 studies in higher education from 2013 to 2023 documenting the effect of teacher feedback on non-cognitive domains of learner performance. From the results of the research, it was found that the provision of any form of feedback by the teachers helped the learners to develop and strengthen non-cognitive skills, such as motivation, self-regulation, cooperation, self-reflection, self-esteem, self-confidence, self-efficacy, criticism thinking, reducing stress, co-constructing knowledge, regulating their emotions, metacognitive awareness. The trainees positively provided feedback from the teachers, perceiving its benefits in developing their social-emotional skills.

**Keywords:** teacher feedback, higher education, non-cognitive skills, student's performance

## 1. Introduction

Feedback is the information provided to a learner to bridge the gap between their current performance and the desired goal (Burgess & Mellis, 2015). Its primary purpose is to help

learners adjust their thoughts and behaviors, revise their work, produce improved learning outcomes, and enhance their performance while developing cognitive and non-cognitive, socio-emotional, and metacognitive skills (Hattie & Timperley, 2007). Social-emotional skills help individuals understand and manage their emotions, create and maintain positive relationships, make responsible decisions, and respond effectively to various social situations (Goleman, 1995; Conley, 2015). These skills are essential for personal well-being, school and workplace success, and overall life satisfaction (Rimm-Kaufman & Pianta, 2015).

The international literature review reveals that only a few studies have examined the impact of various types of feedback on the development of non-cognitive skills. While several sources have been cited (Black & William, 1998; Pekrun et al., 2005; Dweck, 2006; Hattie & Timperley, 2007; Hulleman & Harackiewicz, 2009; Yeager & Dweck, 2012), only one systematic review by Wisniewski, Zierer & Hattie (2020) has investigated the effects of feedback on learner learning in general, focusing on different types of feedback and their impact on learner performance. However, none of these studies exclusively focused on the effect of feedback on non-cognitive aspects of learner performance in higher education, which is the primary focus of this paper.

## **2. The Impact of Teacher Feedback on Non-cognitive Aspects of Student Performance: A Theoretical Perspective**

In the context of higher education, feedback involves providing specific information that compares a learner's observed performance with a standard. The main purpose of feedback is to help improve the learner's performance (Van den Berg et al., 2006). Feedback is an essential part of the learning process and aims to minimize the gap between actual and desired performance (Burgess & Mellis, 2015). The feedback process serves several functions: a) it engages the learner by providing information about the quality of their performance and encourages them to enhance their learning strategies (Shepard, 2000), b) it supports effective decision-making by the learner and contributes to improved learning outcomes (Branch & Paranjape, 2002), c) it acts as a powerful tool to provide the learner with judgments about their performance, thereby aiding in their educational progress (Boud & Molloy, 2013). However, feedback practices are often unsustainable and demoralizing to learners (Boud & Molloy, 2013; Zahid et al., 2017). The ability to assess and provide feedback is a learned skill that requires appropriate training (Hattie & Timperley, 2007). Feedback can come in various forms, such as oral, written, informal, formal, descriptive, evaluative, peer feedback, and self-feedback (Hattie & Timperley, 2007; Boud & Molloy, 2013). Regardless of the form, it is the quality of the feedback that matters. Chappuis (2012) outlines three conditions that must be met before providing feedback, regardless of its form: a) learners need a clear vision of the intended learning, b) activities must be directly aligned with the intended learning, and learners must recognize this connection, and c) assessments must be designed so that learners can interpret the results as indicators of what they have or have not yet learned.

Feedback and non-cognitive skills are interrelated in several ways, particularly in educational and personal development contexts (Conley, 2015). Non-cognitive skills, also known as soft skills or social-emotional skills, are not related to cognitive skills, which focus on intellectual

abilities and academic performance, but focus on emotional-social skills (Matthews & Rugutt, 2019) and have a decisive role in personal and professional success (Salovey, & Mayer, 2016; Brackett, 2019). Non-Feedback and non-cognitive skills are interconnected in various ways, especially in educational and personal development contexts (Conley, 2015). Non-cognitive skills, also referred to as soft skills or social-emotional skills, are distinct from cognitive skills, which emphasize intellectual abilities and academic performance, and instead focus on emotional-social skills (Matthews & Rugutt, 2019). These skills play a crucial role in personal and professional success (Salovey & Mayer, 2016; Brackett, 2019). Non-cognitive skills can be broadly categorized into various dimensions, including:

- a) Communication and interpersonal skills, encompassing communication, listening, presentation and negotiation skills, teamwork and collaboration, conflict resolution, networking, and relationship building (Weissberg et al., 2015; Matthews & Rugutt, 2019).
- b) Emotional Intelligence, which includes self-awareness, self-regulation, motivation, empathy, and stress management (Goleman, 1995; Salovey & Mayer, 2016; Brackett, 2019).
- c) Adaptability, comprising flexibility, resilience, and openness to new ideas (Conley, 2015; Matthews & Rugutt, 2019).
- d) Creativity, involving critical thinking, resourcefulness, and innovation (Rimm-Kaufman & Pianta, 2015; Greenberg & Weissberg, 2017).
- e) Leadership and management skills, encompassing decision-making, delegation, initiative, time management, problem-solving, and conflict management (Saarni, 2007; Davidson & Goldberg, 2012; Conley, 2015; Brackett, 2019).
- f) Work ethic, including responsibility, directness, and integrity (Conley, 2015; Rimm-Kaufman & Pianta, 2015).
- g) Cultural competence, comprising awareness of diversity, inclusiveness, and respect for different points of view (Weissberg et al., 2015; Greenberg & Weissberg, 2017).

Cognitive skills can be broadly categorized into various dimensions, some of which are as follows:

- a) communication and interpersonal skills, including communication, listening, presentation and negotiation skills, teamwork and collaboration, conflict resolution, networking, and relationship building (Weissberg et al., 2015; Matthews & Rugutt, 2019).
- b) Emotional Intelligence includes self-awareness, self-regulation, motivation, empathy, and stress management (Goleman, 1995; Salovey & Mayer, 2016; Brackett, 2019).
- c) adaptability, which includes flexibility, resilience, and receptiveness to new ideas (Conley, 2015; Matthews & Rugutt, 2019)
- d) creativity includes critical thinking, resourcefulness, and innovation (Rimm-Kaufman & Pianta, 2015; Greenberg & Weissberg, 2017).
- e) leadership and management skills, which include decision-making, delegation, initiative,

time management, problem-solving, and conflict management (Saarni, 2007; Davidson & Goldberg, 2012; Conley, 2015; Brackett, 2019)

f) work ethic includes responsibility, directness, and integrity (Conley, 2015; Rimm-Kaufman & Pianta, 2015).

g) cultural competence, which includes awareness of diversity, inclusiveness, and respect for different points of view (Weissberg et al., 2015; Greenberg & Weissberg, 2017).

### **3. Purpose and Research Questions**

The primary aim of this research is to use a literature review methodology to explore the impact of teacher feedback in non-cognitive areas on the academic performance of higher education students, based on an analysis of forty-one research papers published from 2013 to 2023. The main research question is: To what extent does teacher feedback influence the non-cognitive aspects of student performance in higher education? The specific research questions that will be addressed are:

a) What are the findings of the reviewed research on the impact of teacher feedback on the non-cognitive aspects of student performance in higher education?

b) Which types of feedback are most effective in enhancing non-cognitive aspects of student performance in higher education?

c) of teacher feedback on the non-cognitive aspects of student performance in higher education?

d) What was the methodological approach used in the studies under review?

### **4. Previous Systematic Review Studies**

The impact of feedback on learners' non-cognitive skills has been under-researched in recent decades. Black & Wiliam (1998) highlighted the potential of formative assessment and timely feedback in improving learner learning. By providing feedback that targets specific strategies, processes, and areas for improvement, educators can play a crucial role in developing both cognitive and non-cognitive skills, shaping the future of education and psychology.

Although Pekrun et al. (2005) study did not specifically focus on feedback, it developed a framework for understanding academic emotions and their influence on learning. The researchers concluded that effective feedback could affect learners' emotional responses to learning and their non-cognitive skills.

Carol Dweck's (2006) work on mindsets, while not solely focused on feedback, is highly relevant to understanding how feedback can impact non-cognitive skills. The concept of a growth mindset, where individuals believe they can develop their abilities through effort and learning, suggests that feedback, when delivered effectively, can shape students' beliefs about their abilities, resilience, and approach to challenges.

Hattie & Timperley's (2007) meta-analysis examined different types of feedback and their impact on learning outcomes, including both cognitive and non-cognitive aspects. The

researchers emphasized that effective feedback should be timely, specific, and focused on the task rather than the individual.

Hulleman & Harackiewicz (2009) investigated the role of feedback in enhancing learner interest and motivation in science courses. They found that feedback emphasizing the value of effort and linking it to improved performance had a positive impact on both cognitive and non-cognitive outcomes.

Yeager & Dweck (2012) examined how learners' beliefs about their abilities influenced their resilience and response to challenges. They concluded that effective feedback, which encourages a growth mindset, can contribute to developing resilience and persistence.

Wisniewski, Zierer, and Hattie (2020) conducted a systematic research review investigating the effects of feedback on student learning through a meta-analysis of 435 empirical research studies. The results indicated a medium effect of feedback on trainee learning, with a substantial influence from the conveyed information content. Additionally, feedback had a greater impact on cognitive and motor skill outcomes than on motivational and behavioral outcomes.

## 5. Methodology

The present review was methodologically based on the PRISMA 2020 model by Page et al. (2021), which replaces the 2009 model. It includes the stages of identification, separation, suitability control, and final selection of surveys (Figure 1).

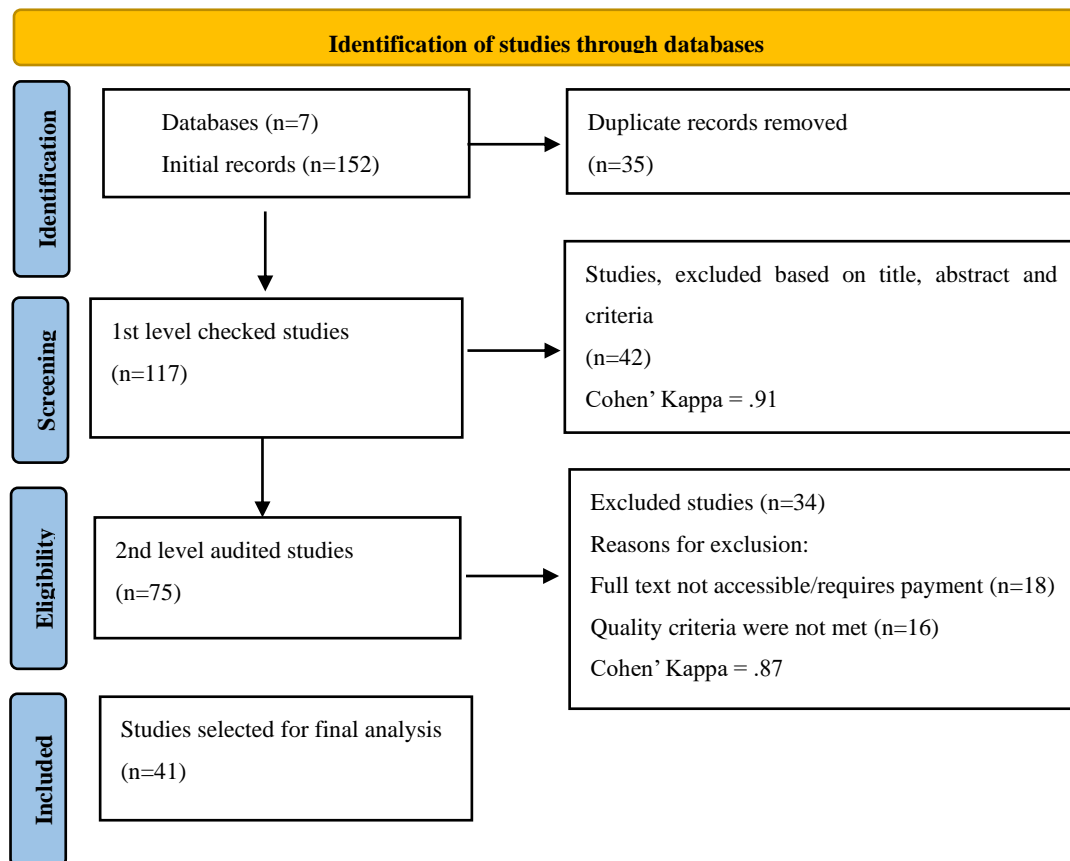


Figure 1. Flowchart of the literature review

The keywords or phrases used were "Feedback" AND "Non-Cognitive Skills," "Feedback" AND "Non-Cognitive Outcomes of Student's Performance," OR "Teacher's Feedback\*" AND "Non-Cognitive Outcomes", OR "Feedback\*" AND "Non-Cognitive Skills of Student's Performance", OR "Teacher's Feedback\*" AND "Non-Cognitive Skills". In addition, the term social-emotional skills were used. The search was mainly done using English terms since the main volume of literature in the field is published in the English language.

Regarding the rationale for choosing the above terms, initially, the terms "Feedback" and "Non-Cognitive Outcomes" and "Non-Cognitive Skills\*" were used, to limit the entries to research related to feedback and non-cognitive skills of the trainees. The term "social-emotional skills\*" was also included to focus on research related to the term. Nevertheless, because many investigations related to other scientific fields, along with the terms above, the term "Education\*" was also included. Finally, the asterisk symbol was also used in the terms above to include as much research as possible, which contained terms with the same letters.

The present review was conducted in seven bibliographic databases: IEEEXplore, SAGE Journals, ScienceDirect, SpringerLink, Google Scholar, Scopus and ResearchGate. With the main aim of broadening the scope of the search compared to previous systematic reviews, the search was initially carried out in Scopus and IEEEXplore, which are two of the largest databases covering a broad subject area. Subsequently, a search was carried out in the scientific databases SpringerLink, ScienceDirect, SAGE Journals and ResearchGate, which include thematic sections focused on the social sciences and humanities. Finally, Google Scholar was also used, despite the limitations in search capabilities, to ensure a comprehensive search across various platforms.

The search based on the above resulted in 152 studies, of which 35 studies were duplicates and were promptly removed. The remaining 117 studies were included in level 1 screening, where titles and abstracts were meticulously analyzed based on the selection criteria (Table 1). To ensure the internal consistency of the procedure, a small number of the same surveys were evaluated, and Cohen's kappa coefficient was calculated (Figure 1). During this process, 42 surveys were excluded, demonstrating the precision and rigor of our selection process.

Table 1. Criteria for inclusion/exclusion of studies in the review

<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Studies written in Greek and English.	Studies written in a language other than English that could not be translated.
Application in the field of education.	They are not concerned about the application in the field of education.
They were reporting on the effect of feedback in non-cognitive domains of learner performance in higher education.	They do not address the effect of feedback in non-cognitive domains of learner performance in higher education.
The summary states some information.	Reviews/theoretical studies
Publication year from 2013-2023	Publication year before 2013.



The remaining 75 studies proceeded to level 2 screening, where their main text was reviewed. Out of these, 18 surveys were excluded because they required payment for access. The quality of the remaining 57 studies was assessed based on specific criteria: a) the description of the context of the effect of feedback on non-cognitive fields of learners' performance in higher education (cognitive field, type of research), b) the methodological design used (type of data collected, sample of participants), and c) the data collection method and research tools used.

Following this evaluation, 41 studies were selected for the systematic review, meeting the established criteria. Additionally, the internal consistency of the process was evaluated by calculating Cohen's kappa coefficient (Figure 1).

## 6. Results

Table 2 presents the researched studies in higher education that were identified through a bibliographic search on the impact of teacher feedback on non-cognitive aspects of student performance. The information provided for each study includes the researcher/s, time and country of implementation, purpose, research type, sample size, subject, and the results obtained.

Table 2. Impact of teacher feedback on non-cognitive aspects of learner performance in higher education.

<b>Researcher s Year Country</b>	<b>Purpose of research</b>	<b>Type of research Sample size Subject</b>	<b>Results</b>
Saeed, Lodhi, Sadiq, Hashmi, Sami, Dustgeer & Ahmad 2013 Pakistan	Studying the impact of teacher feedback on students' intrinsic motivation and academic performance.	quantitative research 150 undergraduate students	Feedback is crucial for fostering learners' intrinsic motivation.
Medina, Conway, Davis-Max well & Webb 2013 USA	Determining the necessary feedback to enhance problem-solving skills in group learning using a problem-solving rubric.	action research 229 undergraduate students Pharmaceutical sciences	The trainees significantly improved their ability to prioritize presented information and their overall problem-solving rubric scores after receiving verbal and written feedback.
Zhang,	Investigating the impact of electronic feedback	mixed research	Group collaboration via a blog fosters teamwork,

Song, Shen & Huang 2014 China	on enhancing learners' writing experience and its correlation with learner motivation, collaboration, and satisfaction.	36 undergraduate students	self-reflection, and co-creation of knowledge.
Lindon-Morris & Laidlaw 2014 UK	Investigating how learners' anxiety and self-awareness affected their learning experience in video feedback workshops.	47 undergraduate students	Trainees expressed high anxiety about being recorded while interacting with a simulated patient, leading to heightened public self-awareness. Concerns about judgment from fellow learners were prevalent.
Sheldon, Dunning & Ames 2014 USA	Exploring the significance of self-awareness in expressing overly optimistic views of learners' expertise and performance, and its expansion to emotional intelligence assessments.	157 postgraduate students	After receiving feedback, high-performing learners demonstrated greater self-awareness and a stronger desire to enhance their emotional intelligence compared to less-skilled learners.
Ekholm, Zumbrunn & Conklin 2015 USA	Exploring the predictive and mediating roles of learners' self-efficacy and feedback perceptions on self-regulated writing ability.	quantitative research 115 undergraduate students 23 male, 92 female	Results showed that learners' perceptions of the feedback they receive on their writing assignments partially mediated the relationship between writing self-efficacy and writing self-regulatory beliefs.
Brown, Peterso & Yao 2016 New Zealand	Exploring learners' beliefs about the role and purpose of feedback and their relationship to self-reported self-regulation and self-efficacy.	Academic writing mixed research 278 undergraduate students 97 male, 181 female	The research findings not only highlight the importance of feedback in learning but also provide practical insights. They demonstrate how feedback can significantly enhance self-regulation, academic self-efficacy, and grade point average, thereby



Johnson & Cooke 2016 Australia	Determining the correlation between self-regulated learning and feedback preference in distance education.	quantitative research 102 undergraduate students New Technologies	offering tangible benefits for educators and learners. Participants preferred written feedback, while learners who listened to recorded feedback valued peer interaction and personal challenges more than those who preferred written feedback.
Bono, Núñez-Peña & Suárez-Pellicioni 2017 Spain	Studying the impact of teachers giving students oral and written feedback using rubrics.	quantitative research 135 undergraduate students Psychology	There were no statistically significant differences in terms of academic achievement. However, learners who received verbal feedback asked fewer questions. Learners who received written feedback through rubrics felt less anxious about the exams and received higher grades.
Prantziou 2017 Greece	Exploring students' opinions on receiving feedback for improving writing self-regulation in postgraduate distance education.	quantitative research 38 postgraduate students Academic Writing	Learners who are optimistic about feedback develop and strengthen their writing self-regulation, unlike those who are pessimistic about receiving feedback.
Zheng, Cui, Li & Huang 2018 China	Investigating the impact of synchronous discussion between assessors and students on written performance, feedback quality, metacognitive awareness, and self-efficacy in online assessment.	action research 64 undergraduate students Academic Writing New Technologies	The synchronous discussion between assessors and students resulted in significant improvements in trainees' writing performance, particularly in content writing skills. This method also enhanced the quality of affective and metacognitive feedback, metacognitive awareness, and self-efficacy.
Recep, Korkmaz, Bacanak & Arslan	"Researching how students' feedback preferences relate to their self-regulated	mixed research 205 undergraduate students	Learners with strong self-regulated learning skills rely less on formative feedback compared to those

2018 Turkey	learning skills."	68 male, 137 female		with weaker self-regulated learning skills.
Pratiwi, Winarko & Ayu	Determining the impact of implementing problem-solving strategies using online feedback on learners' comprehension of concepts.	60 undergraduate students	action research	Conceptual understanding of problem-solving is enhanced by providing learners with formative assessment and online feedback.
2018 Indonesia	Investigating the impact of peer feedback on academic performance, stress reduction, and self-regulation among learners.	150 undergraduate students	Physics Education New Technologies quantitative research	Peer feedback had a positive impact on the academic performance of learners. It also aided them in evaluating their peers' writing, reducing their anxiety, and increasing their self-regulation.
Nafi & Nazari	Studying the impact of corrective feedback on learners' writing performance.	6 undergraduate students	English as a foreign language qualitative research	The provision of corrective feedback enhanced learners' academic writing performance, boosted their self-confidence, and fostered critical thinking skills.
2020 Afganistan	Studying the effects of AI-enabled real-time feedback on team dynamics and individual behavior.	160 undergraduate students	action research	Participants who received this feedback experienced a two-fold increase in self-assessed proficiency, improved performance, and heightened critical thinking and self-assessment abilities.
Wahyuning sih	Investigating the impact of feedback on improving academic writing and utilizing writing strategies to enhance intrinsic motivation and self-efficacy.	145 postgraduate students	English as a foreign language quantitative research	A positive correlation exists between feedback and writing strategies. Feedback boosts intrinsic motivation in writing assignments, while a weak positive correlation exists between learners' self-efficacy and writing strategies.
2020 Indonesia	Investigating the impact of AI-enabled real-time feedback on team dynamics and individual behavior.	160 undergraduate students	action research	Participants who received this feedback experienced a two-fold increase in self-assessed proficiency, improved performance, and heightened critical thinking and self-assessment abilities.
Porter & Grippa	Investigating the impact of feedback on improving academic writing and utilizing writing strategies to enhance intrinsic motivation and self-efficacy.	145 postgraduate students	English as a foreign language quantitative research	A positive correlation exists between feedback and writing strategies. Feedback boosts intrinsic motivation in writing assignments, while a weak positive correlation exists between learners' self-efficacy and writing strategies.
2020 USA	Investigating the impact of feedback on improving academic writing and utilizing writing strategies to enhance intrinsic motivation and self-efficacy.	145 postgraduate students	English as a foreign language quantitative research	A positive correlation exists between feedback and writing strategies. Feedback boosts intrinsic motivation in writing assignments, while a weak positive correlation exists between learners' self-efficacy and writing strategies.
Anagnosti & Sofos	Investigating the impact of feedback on improving academic writing and utilizing writing strategies to enhance intrinsic motivation and self-efficacy.	145 postgraduate students	English as a foreign language quantitative research	A positive correlation exists between feedback and writing strategies. Feedback boosts intrinsic motivation in writing assignments, while a weak positive correlation exists between learners' self-efficacy and writing strategies.
2020 Greece	Investigating the impact of feedback on improving academic writing and utilizing writing strategies to enhance intrinsic motivation and self-efficacy.	145 postgraduate students	English as a foreign language quantitative research	A positive correlation exists between feedback and writing strategies. Feedback boosts intrinsic motivation in writing assignments, while a weak positive correlation exists between learners' self-efficacy and writing strategies.
	Investigating the	quantitative		Perceived teacher feedback

Wang & Zhang	mediating effect of learning engagement on the relationship between teacher feedback and learner achievement and examining the impact of assessment characteristics on the relationship between perceived teacher feedback and learning engagement.	research 2.458 undergraduate students	China	positively impacted students' academic performance, with learning engagement mediating the effect. The frequency, difficulty, and variety of assessments moderated the relationship between perceived teacher feedback and learning engagement.
Younis, Imdad & Rahman	Evaluating the impact of timely and constructive feedback on learner performance and understanding learner experiences.	action research 151 undergraduate students 35 male, 116 female	Pakistan	Providing constructive feedback improves learner performance by creating a safe learning environment, fostering effective communication, and establishing clear learning objectives. Fear and inadequate communication were the primary barriers impacting performance.
Suamuang, Easter, & Suksakulchai	Investigating the impact of feedback on three self-regulatory constructs on task completion and academic achievement.	mixed research 1.106 undergraduate students 405 male, 701 female	Thailand	The number of completed assignments has a strong correlation with academic success. Effective time management was the most significant factor influencing the number of tasks completed and acted as a mediator between self-efficacy and task completion.
Li & Reynolds	Exploring how learners utilized emotional intelligence to moderate the feedback process for research proposal writing.	mixed research 2 doctoral students English as a foreign language	China	Feedback providers utilized various emotional intelligence patterns to manage the feedback process, influenced by five factors: goals and objectives, previous feedback experience, time

Navarro Jover 2021 Spain	Determining how providing feedback improves learners' self-regulation and academic performance.	action research 40 undergraduate students Engineering-technical drawing	constraints, the intimacy of relationships, and the feedback providers' perceived importance of components in a research proposal. It has been confirmed that setting goals, believing in oneself, and anticipating outcomes are crucial motivational factors that influence self-regulation.
Inan-Karagul & Seker 2021 Turkey	Investigating the effects of an online feedback program that incorporates self-regulated learning writing strategies in screen feedback, following the cyclical model of self-regulated learning (anticipation, performance, and reflection on performance).	mixed research 135 undergraduate students English as a foreign language New Technologies	Results show a significant increase in the use of self-regulated learning writing strategy after receiving instruction and feedback.
Afzaal, Nouri, Zia, Papapetrou, Fors, Wu, Li & Weegar 2021 Sweden	Investigating how an AI application can use learning management system data to help learners self-regulate their learning and improve academic performance by building predictive models for feedback.	action research 178 undergraduate students New Technologies	The evaluation results indicated that the targeted use of artificial intelligence supported learners in self-regulation, thereby boosting their motivation and enhancing their academic performance.
Theobald & Bellhäuser 2022 Germany	Examining the effects of different types of adaptive online feedback (with metacognitive and motivational aspects) on learners' self-regulated learning,	action research 257 undergraduate students New Technologies	Results indicated that feedback interventions effectively enhanced learners' self-regulated learning and performance. Motivation and self-efficacy were not significantly impacted by any feedback.

	motivation, and achievement.		
Mayordomo, Espasa, Guasch & Martínez-Melo	Studying how perceived feedback affects learner engagement with feedback.	action research 191 postgraduate students 16 male, 175 female	However, there were no significant differences in feedback perception, indicating the importance of feedback valence perception in the resubmission condition. A significant relationship was found between affective engagement and cognitive engagement with feedback, depending on how it was perceived.
2022			
Spain			
Al-Darei & Elhag	Investigating the impact of various types of feedback in an online learning setting on improving student performance and engagement.	action research 97 undergraduate students Computer Sciences New Technologies	All types of feedback, especially interpretation, impact learners' academic performance. Learners who received varied feedback showed increased motivation and positive impact.
2022			
Oman			
Weng, Ye & Xue	Studying the influence of peer feedback on students' motivation to write.	mixed research 76 undergraduate students English as a foreign language	Peer feedback significantly influenced learners' attitudes toward writing lessons, boosting their self-confidence with a minimal impact on anxiety.
2022			
China			
Noroozi, Kerman, Banihashem & Biemans	Investigating the Impact of Learners' Perceived Motivation and Feedback on Their Satisfaction with Argumentative Essay Writing in an Online Learning Environment.	mixed research 135 undergraduate students Academic Writing	The satisfaction of learners' learning is influenced by their perceived motivation and the fair feedback perceived from their peers.
2022			
Netherland			
Narciss, Prescher, Khalifah & Körndle	Investigating the impact of internal and external feedback on learners' achievement, strategies, and motivation in	action research 121 undergraduate students	Combining internal and external feedback was more beneficial for achieving concept learning, strategy use, and learners' intrinsic

2022 Germany	concept learning.			motivation and perceived competence than providing internal or external feedback alone.
Johannes & Haase 2022 Germany	A comparison of two types of feedback regarding learning progress and changes in learner self-confidence.	action research 75 undergraduate students		The type of feedback did not affect self-efficacy and changes in metacognitive monitoring.
Chakarvarti 2022 USA	Determining the extent to which learners benefit from receiving information from their peers when developing critical thinking skills.	action research 60 undergraduate students		Peer feedback, as an instructional strategy, significantly promotes learners' critical thinking.
Kyne, Lee & Reyes 2023 Australia	Studying the effects of electronic feedback on academic performance and student success.	action research 6.334 undergraduate students Chemistry New Technologies		Learners who received online feedback were more likely to pass the course. Additionally, sending personalized feedback emails encouraged higher learner success in more significant numbers and student evaluation of customized feedback.
Turner 2023 Sweden	Exploring the intricate connection between students' attitudes toward peer and teacher feedback, academic performance, and engaging in dialogue, with a focus on developing literary disciplinary knowledge.	mixed research 25 undergraduate students English as a foreign language		A positive correlation was found between students' attitudes toward receiving feedback on developing disciplinary knowledge and their achievement in literary studies. Additionally, actively engaging with feedback is linked to improved writing ability.
Ismail, Nasri & Salem 2023	Investigating learner engagement with teacher feedback from a multidimensional perspective, including acceptance, affective engagement, cognitive and metacognitive	mixed research 90 undergraduate students English as a foreign language		The use of written corrective feedback, combined with an effective teaching approach, assists learners in adjusting to various cultural values. It promotes self-regulation, the adoption of new

Saudi Arabia	engagement, and behavioral engagement.		behaviors, and their integration into the learning process.
Liu et al. 2023	Investigating the significance of different types of feedback (simultaneous, trial-final) through simulation to optimize timing for supporting learners' skill development.	action research 32 undergraduate students Medical Education	The group that received concurrent feedback had higher scores than the group that received terminal feedback. There was no difference in cognitive load and anxiety between the groups. Participants receiving concurrent feedback were more satisfied with their learning experience.
Nguyen & Trang 2023	Investigating the impact of using Padlet feedback on the writing and motivation of English language learners.	mixed research 66 undergraduate students English as a foreign language New Technologies	Using Padlet feedback improved English language learners' email writing. Additionally, integrating Padlet increased learners' motivation to write.
Gan, Liu & Nang 2023	Investigating how different forms of motivation predict learners' engagement in teacher feedback and feedback-seeking behavior.	quantitative research 276 undergraduate students 33 male, 243 female English as a foreign language, Literature	Task value predicted both learners' actions on teacher feedback and feedback seeking. Intrinsic motivation significantly predicted teacher feedback action, while extrinsic motivation and self-efficacy predicted feedback seeking.
Cacciamani, Perrucci, Khanlari & Balboni 2023	Investigating the correlation between community engagement and feedback participation in a blended university course developed using the Progressive Design Method.	action research 30 undergraduate students New Technologies	The learning dimension of a sense of community is positively related to the number of feedback messages about the project's positive aspects, as is the social dimension of a sense of community.
Yang, Wu, Liang &	The study aimed to investigate how students manage their	qualitative research	Learners expressed dissatisfaction with feedback that did not meet



Yang 2023 China	emotions in response to feedback based on their feedback orientation.	11 undergraduate students	their expectations or was unrealistic. Their feedback orientation supported emotion regulation techniques, which in turn supported adaptive feedback processing.
Afzaal, Zia, Nouri & Fors 2023 Sweden	It is being investigated whether an artificial intelligence application that offers automated and intelligent feedback can assist learners in self-regulating their learning in a data-driven manner to enhance their performance.	action research 446 undergraduate students New Technologies	The results showed that providing this feedback significantly boosted learners' academic performance and enhanced their ability to regulate their own learning.

Thirty-eight of the selected research articles are from journals, while only three are from conferences. Additionally, Thirty-nine investigations were conducted internationally, with two taking place in Greece.

Figure 2 illustrates the number of surveys conducted per year.

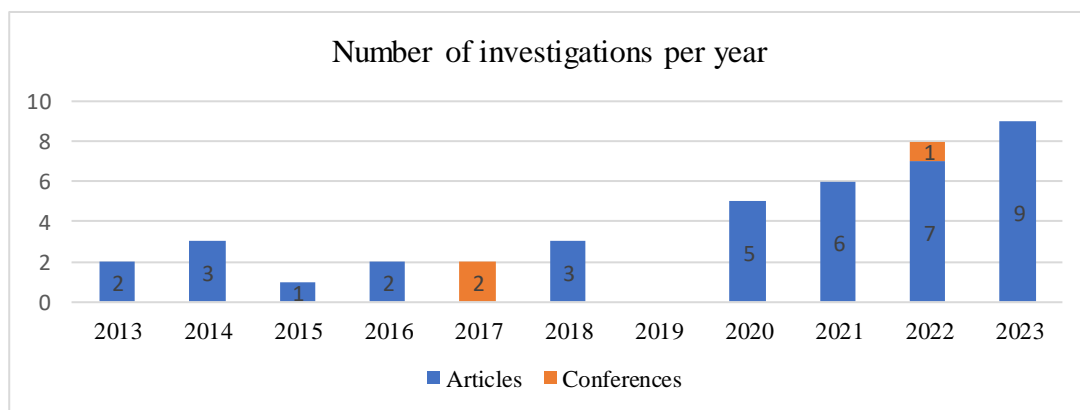


Figure 2. Number of investigations per year

## 6. Discussion of Research Results

The majority of studies (n=18) are from Asian countries (seven from China, two each from Pakistan, Turkey, and Indonesia, and one each from Afghanistan, Thailand, Oman, S. Arabia and Vietnam), followed by the surveys (n=14) from the European continent (from three surveys Spain, Sweden and Germany, two surveys from Greece and one survey the Netherlands, Italy and the United Kingdom), America ( n=6) with six surveys from the USA

and Oceania (n=3) with two surveys from Australia and one from New Zealand. In terms of countries, China (n=7) and the USA (n=6) found the most significant number of studies.

Regarding the type of research, the vast majority of research applied action research (n=19) and mixed methods (n=11). At the same time, fewer researchers applied quantitative (n=9) and qualitative data collection methods (n=2). Most of the surveys conducted included a sample of 101 to 500 participants (n=20), followed by surveys with a sample of 51 to 100 people (n=8), 31 to 50 people (N=6), with a larger sample from 500 people (n=3), from 1 to 10 people (n=2) and from 11 to 30 people (n=2). In addition, it is worth noting that seven surveys provided information on the proportion of men and women in the survey sample.

The research studies span a wide range of subjects, reflecting the multidisciplinary nature of the research. Seventeen research do not refer to any specific subject, indicating a broad scope. Of the remaining surveys, ten focus on the course of English as a second (n=2) or as a foreign language (n=8), highlighting the importance of language learning. Four studies are in the health sector, with studies in Medicine (n=2), Nursing (n=1) and Pharmacy (n=1), underscoring the significance of healthcare research. Five research deal with academic writing, one with Psychology, and one each in Physical Education, Informatics, Chemistry and Engineering-Design, showcasing the diversity of academic interests. Finally, fourteen research apply elements of New Technologies, indicating the growing influence of technology in research.

Through this systematic review of research, it was found that feedback can have a significant impact on the development of non-cognitive skills. Regarding communication and interpersonal skills, the provision of different types of feedback (oral-written, perceptual, constructive, electronic, internal-external) by teachers significantly enhanced the skills of various forms of communication (Younis et al., 2021; Kyne et al., 2023), b) listening (Johnson & Cooke, 2016; Bono et al., 2017; Narciss et al., 2022), c) teamwork and collaboration (Zhang et al., 2014; Turner, 2023; Cacciamani et al., 2023), d) conflict resolution (Narciss et al., 2022 Turner, 2023), networking and relationship building (Wang & Zhang, 2020; Turner, 2023; Cacciamani et al., 2023).

Regarding the area of creativity, providing different types of feedback (oral-written, corrective, electronic, a combination of teacher and learner feedback) enhanced critical thinking (Zhang et al., 2014; Wahyuningsih, 2020; Porter & Grippa, 2020; Chakarvarti, 2022) and encouraged learner ingenuity (Medina, 2013). In adaptability, learners demonstrated flexibility and receptiveness to new ideas (Turner, 2023). In the field of leadership and management skills development, the provision of both final and electronic feedback by teachers led learners to make appropriate decisions to solve problems (Medina, 2013; Pratiwi et al., 2018; Kyne et al., 2023) with parallel time management and taking initiatives (Kyne et al., 2023).

The correlation of feedback with work ethic is essential since different types of teacher feedback (perceived, final) had a positive impact on student's academic performance with a significant effect on learning engagement and responsibility (Wang & Zhang, 2020; Liu et al., 2023), while feedback from trainees regarding the development of disciplinary knowledge

and responsibility was positively addressed (Turner, 2023). Regarding cultural competence, the application of written corrective feedback helped the learners to adapt epistemologically and culturally to different cultural values (Ismail et al., 2023) while simultaneously strengthening the social dimension of the sense of community (Cacciamani et al., 2023).

The majority of research findings were in the field of emotional intelligence. The findings indicate a positive connection between feedback and different types of motivation, such as intrinsic, perceived, and extrinsic motivation, as they are essential factors in motivating learners and influencing their learning satisfaction (Saeed et al., 2013; Noroozi et al., 2022; Gan et al., 2023). Furthermore, the research concluded that learners' motivation to learn was significantly enhanced by the provision of various types of feedback, including electronic (Afzaal, 2021; Nguyen & Trang, 2023), interpretive (Al-Darei & Elhag, 2022), internal, and external feedback (Narciss et al., 2022). Additionally, providing teacher feedback significantly strengthened the trainees' motivation to write written assignments (Anagnosti & Sofos, 2020). One study found that motivation was not significantly affected by any type of electronic feedback (Theobald & Bellhäuser, 2022).

Self-regulation research has shown that providing feedback contributes positively and significantly to the improvement of learners' self-regulated learning skills (Brown, Peterson & Yao, 2016; Johnson & Cooke, 2016; Zheng et al., 2018; Nafi & Nazari, 2020; Inan-Karagul, 2021; Theobald & Salem, 2023). This improvement depends to a significant extent on learners' perceptions of feedback (Ekholm et al., 2015; Prantziou, 2017), as well as on their goal-setting and self-efficacy (Navarro Jover, 2021; Suamuang et al., 2021). Furthermore, a study revealed that learners with high self-regulated learning skills rarely depend on formative feedback (Recep et al., 2018).

Among the significant research findings are those related to stress management, according to which the provision of feedback significantly helped learners to reduce their stress (Bono et al., 2017; Nafi & Nazari, 2020; Weng et al., 2022), although in one case learners had a high level of anxiety at the prospect of participating in the feedback process (Lindon - Morris & Laidlaw, 2014). One study showed no difference between cognitive load and anxiety (Liu et al., 2023).

Finally, about other subcategories of emotional intelligence, research has documented that the provision of feedback by teachers encouraged self-reflection (Zhang et al., 2014), self-awareness (Lindon-Morris & Laidlaw, 2014), self-improvement (Sheldon et al., 2014), self-confidence (Wahyuningsih, 2020; Weng et al., 2022).

For their part, learners were positively disposed to the provision of feedback by teachers, perceiving its effect on self-efficacy and self-regulation (Ekholm et al., 2015), preferring written over recorded feedback (Johnson & Cooke, 2016) and simultaneous versus final (Liu et al., 2023). It is worth noting that the learners pointed out that the feedback should meet their expectations to respond positively (Yang et al., 2023). Finally, although learners are positive about providing feedback from their fellow learners (Zhang et al., 2014; Noroozi et al., 2022), in one research, there was concern that it might not be objective (Lindon - Morris & Laidlaw, 2014).

The results of the effect of e-feedback through artificial intelligence are of interest since its provision enhanced learners' self-regulated learning skills, motivation, critical thinking, and self-reflection skills (Porter & Grippa, 2020; Afzaal et al., 2021; Afzaal et al., 2023). Furthermore, the combination of providing feedback from teachers and fellow learners had significant positive effects on enhancing learners' motivation and self-confidence, reducing their anxiety and increasing their self-regulation (Nafi & Nazari, 2020; Weng et al., 2023; Turner, 2023), in enhancing collaboration and self-reflection (Zhang et al., 2014) as well as promoting critical thinking (Chakarvarti, 2022).

## **7. Conclusion**

The present systematic review was conducted using seven bibliographic databases and initially resulted in 152 studies. After applying the revised PRISMA 2020 statement, duplicate studies were removed, and two-level checks were performed, including exclusion of studies based on title, abstract, criteria, non-access to full text, and completeness of quality criteria. The research yielded 41 studies that addressed the research questions, which have been developed in the past decade in both international and Greek higher education settings.

There are more action research studies with a sample size ranging from 30 to 6,334 people, followed by mixed research with a sample of 25 to 1,106 people, quantitative research with a sample of 38 to 2,458 people, and qualitative research with a sample of 6 to 36 participants. The majority of the research did not focus on any specific academic subject, while several others addressed subjects such as English as a second or foreign language, academic writing, and medicine.

The bibliographic research produced interesting results regarding the impact of teacher feedback on non-cognitive aspects of student performance in higher education. It was found that the provision of any form of feedback by teachers helped the learners by significantly enhancing their motivation to learn and contributing to the development of critical social-emotional skills, such as self-regulation, cooperation, self-reflection, self-esteem, self-confidence, self-efficacy, critical thinking, stress reduction, knowledge construction, emotion regulation, and metacognitive awareness. The learners also responded positively to receiving feedback from teachers, perceiving its benefits in developing their social-emotional skills, expressing preferences for specific types of feedback, and meeting their expectations. However, a few studies identified an increase in trainees' stress levels and concerns about being judged inadequate by their peers.

In terms of types of feedback, the provision of oral and written feedback, electronic-online feedback, and peer feedback positively impacted learners' academic performance and the development of their social-emotional skills. To a lesser extent, similar results were found in research on other types of feedback, such as using rubrics, perceptual feedback, interpretive feedback, internal and external feedback, and simultaneous feedback.

## **8. Limitations - Proposals**

The limitations of the current research include the limited number of studies reviewed, the restriction to specific search engines, the inaccessibility of some studies, and the focus solely

on the contribution of feedback to non-cognitive aspects of learner performance in higher education. Suggestions for future research could involve exploring, both theoretically and practically, how feedback contributes to the non-cognitive aspects of learners' performance in primary and secondary education.

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