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Article

Mentoring and metacognition—Interferences and interdependencies

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Abstract: This paper conducts a comparative analysis of mentoring and metacognition in education, unveiling their intricate connections. Both concepts, though seemingly disparate, prove to be interdependent within the educational landscape. The analysis showcases the dynamic interplay between mentoring and metacognition, emphasizing their reciprocal influence. Metacognition, often perceived as self-awareness and introspection, is found to complement the relational and supportive nature of mentoring. Within this context, metacognitive education within mentoring emerges as a vital component. Practical recommendations are offered for effective metacognitive training, highlighting its role in enhancing cognitive and metacognitive skills. Moreover, the paper introduces the concept of a "mentoring scaffolding system." This system emphasizes mentor-led gradual independence for mentees, facilitating their professional and personal growth. The necessity of fostering a metacognition culture in education is a central theme. Such a culture promotes improved performance and lifelong learning. The paper suggests integrating metacognition into curricula and empowering learners as essential steps toward achieving this culture. In conclusion, this paper advocates for the integration of metacognition into mentoring and education, fostering self-awareness, independence, and adaptability. These attributes are deemed crucial for individuals navigating the challenges of the information age.

Keywords: mentoring; metacognition; education; comparative analysis; metacognitive education

1. Introduction

In the realm of education, two distinct yet interconnected concepts have garnered significant attention: mentoring (Hansford and Ehrich, 2006) and metacognition (Lai, 2011; Silistraru and Gheorghe 2021). While these concepts may initially appear to inhabit separate domains, a closer examination reveals a rich tapestry of interdependencies. This paper embarks on a comparative analysis to unravel the intricate relationship between mentoring and metacognition, addressing key research

gaps and deficits that necessitate exploration.

Mentoring, characterized by guidance, support, and relational dynamics, often involves the active engagement of one individual in facilitating the growth and development of another. In contrast, metacognition centers on introspection, self-awareness, and the understanding of one's cognitive processes. It is, in essence, thinking about thinking.

Our research is motivated by the recognition that while mentoring and metacognition have been studied independently, there is a notable lack of comprehensive investigations into their synergistic potential in the educational context. This gap in the literature leaves us with significant research deficits to explore and address. Specifically, we aim to elucidate the importance of these research deficits and demonstrate their worthiness as subjects of study.

This analysis not only elucidates the dynamic interplay between mentoring and metacognition but also underscores their collective significance in the educational context. By exploring the ways in which metacognition complements mentoring and vice versa, this paper aims to shed light on the potential synergies that can enhance the educational experience, bridging the gap in understanding the combined impact of these two critical elements of education.

Moreover, the paper delves into the realm of metacognitive education within mentoring, offering practical insights and recommendations for its effective implementation. It introduces the concept of a "mentoring scaffolding system," emphasizing mentor-led gradual independence for mentees, a pivotal aspect of the mentoring process. By doing so, we hope to address the research deficit regarding the practical implementation of metacognitive strategies within mentoring relationships.

Furthermore, the paper advocates for the cultivation of a metacognition culture in education, emphasizing its role in improving performance and fostering lifelong learning. It calls for the integration of metacognition into educational curricula and the empowerment of learners to navigate the complexities of the information age, addressing the deficit in comprehensive strategies for enhancing metacognitive skills within educational systems.

Ultimately, this paper aims to provide a comprehensive understanding of how mentoring and metacognition converge to create a robust foundation for effective education, nurturing self-aware, independent, and adaptable learners poised to thrive in an evolving educational landscape while highlighting the research deficits that make this exploration necessary.

2. Review of literature

Mentoring has a longstanding history as a valuable practice in education, contributing significantly to the growth and development of students, novice educators, and professionals across diverse fields. Kram's (1985) seminal work in 1985 introduced the concept of developmental mentoring, shedding light on the pivotal role of reciprocal relationships in nurturing both career and personal advancement. This model places a strong emphasis on the gradual evolution of mentorship bonds over time, recognizing their substantial impact on mentors and mentees alike.

Allen et al. (2004) conducted an extensive meta-analysis that underscores the

concrete advantages of mentoring. Their research reveals the positive outcomes associated with mentoring for proteges, including heightened job satisfaction, increased earning potential, and a stronger commitment to the organizations they are a part of. These findings underscore the tangible benefits of mentorship programs and provide empirical evidence of their effectiveness in fostering career development.

Metacognition is a central construct in the realm of learning, encompassing an individual's awareness and control of their cognitive processes. At its core, metacognition plays a pivotal role in the process of learning and problem-solving. Flavell's (1979) groundbreaking work in 1979 provided a foundational understanding of metacognition, coining it as "thinking about thinking." His research served as a cornerstone for recognizing the significance of metacognitive skills in enhancing learning outcomes. Flavell's (1979) work particularly emphasized the role of metacognition in self-monitoring, self-regulation, and self-reflection during the learning journey.

Vrugt and Oort (2008) delved into the intricate relationship between metacognition and academic achievement. Their study explored how metacognitive processes, in conjunction with achievement goals and study strategies, impact the academic success of university students. Their findings illuminated the practical implications of metacognition within educational settings, highlighting its crucial role in promoting effective learning strategies.

More recently, in Jiang and collaborators research (Jiang et al., 2023), an extended model of the planned behavior theory was employed, utilizing a PLS-SEM approach to investigate the direct, indirect, mediating, and moderating roles of students' growth mindset in self-regulated learning intention during the COVID-19 pandemic. Their findings affirmed the positive influence of students' growth mindset on this learning process, whether through planned behavioral control, students' learning attitude, or the direct path to self-regulated learning intention. Furthermore, students' growth mindset was observed to mediate and moderate the relationship between perceived teacher support and self-regulated learning intention. This research adds significant insights into the role of growth mindset in self-regulated learning, the importance of teacher support, and the application of the planned behavior theory during challenging circumstances like the pandemic (Jiang et al., 2023).

Similarly, Yao and collaborators (Yao et al., 2022) developed a novel model merging the technology acceptance model (TAM) and the theory of planned behavior (TPB) to explore the impact of self-awareness on students continued use intention of online learning during the post-pandemic period. The study revealed that self-awareness enhanced perceived ease of use, which, in turn, positively influenced continued use intention. Additionally, it found that self-awareness had a substantial effect on perceived behavioral control and attitudes toward online learning, further impacting participants' propensity to continue using online learning. This research underscores the psychological factors influencing students' engagement in online learning and highlights the necessity of considering self-awareness in the post-pandemic online learning landscape (Yao et al., 2022).

Finally, Jiang and collaborators (Jiang, Wang, et al., 2022) study delved into the factors affecting students' self-regulated learning intention in blended learning settings, combining TPB with major satisfaction and teacher support. Their findings

demonstrated the positive impact of perceived teacher support and TPB constructs on self-regulated learning intention within a blended learning context. Moreover, the study revealed that attitude toward self-regulated learning, perceived behavior control, and subjective norm acted as mediators between these factors. The research emphasizes the role of teacher support and major satisfaction in influencing students' willingness to engage in self-regulated learning in blended learning settings, shedding light on the significance of external and psychological factors in enhancing the learning process (Jiang, Wang, et al., 2022).

In summary, these three studies collectively contribute to our understanding of student learning experiences in various contexts, ranging from self-regulated learning during the pandemic to online learning and blended learning. They emphasize the importance of psychological and external factors, such as growth mindset, self-awareness, teacher support, and major satisfaction, in shaping students' learning intentions and outcomes, providing valuable insights for educators and policymakers.

The literature consistently emphasizes the significance of fostering a metacognition culture in educational environments. This culture not only enhances individual performance but also instills a commitment to lifelong learning. It encourages learners to continually reflect on and refine their cognitive processes, ultimately leading to improved learning outcomes and problem-solving abilities.

From a curricular perspective, the integration of metacognition is of paramount importance. This integration represents a pivotal shift in educational paradigms, promoting a holistic approach to learning that encompasses metacognition. This new educational paradigm emphasizes learning with, through, and for metacognition, recognizing it as a critical component of effective learning and cognitive development.

Within this metacognition culture, didactic implications come to the forefront. The value of metacognitive mediation becomes apparent as educators and mentors play a pivotal role in guiding learners to develop metacognitive skills. Educators act as metacognitive mediators, facilitating the acquisition and application of metacognitive strategies. Simultaneously, learners are encouraged to take active control of their thinking processes, becoming self-regulated learners capable of metacognitive reflection and self-improvement.

In summary, the synthesis of the literature underscores the profound impact of mentoring on personal and career development while emphasizing the pivotal role of metacognition in learning and problem-solving. The cultivation of a metacognition culture and its integration into educational curricula represent critical steps toward enhancing the learning experience and fostering a lifelong commitment to self-improvement and cognitive growth.

3. Methodology

Our approach aims at conducting a multidimensional and operational comparative analysis between two complex and layered concepts that are currently of special interest in the field of education-mentoring and metacognition. Apparently, the two concepts are, at first glance, different and divergent, as metacognition predominantly involves introspection and self-awareness of the inner self, while

mentoring necessarily involves interrelationship, establishing a bond with another person in a supportive role.

The considerations and analyses that we have carried out are based on our reflections, (e)documentation processes and the results of these processes, which involved information selection, critical, constructive and creative analysis, articulation and systematization. The result is presented by us in a tabular form, which allows to easily grasp the characteristics of mentoring and metacognition, presented according to certain elements of analysis.

Our multidimensional analysis allows us to identify links, interferences and even interdependencies between mentoring and metacognition. Both are non-linear and dynamic processes, involving the interrelation of several dimensions and components that naturally establish reciprocal links between them.

Table 1 facilitates the conceptual symmetry, i.e., the comparison of the two concepts through associative processes of associations of ideas. For example, according to Anderson (2002), metacognition involves processes that can be divided into five basic components: preparing and planning learning, selecting and using a learning strategy, monitoring the use of the strategy, orchestrating different strategies, evaluating learning and strategy use. In **Figure 1** we have illustrated these five basic components, which in our view are subordinate to the objectives of the learning activity.

Table 1. Comparative multi-means analysis between mentoring and metacognition.

Element of analysis	Mentoring	Metacognition
Status	Complex professional activity carried out by a mentor, through direct/technologically mediated communication, guiding the work of another person, facilitating his/her learning, professional, personal and social development (building professional and social identity) (Huizing, 2012).	A set of cognitive activities through which the subject becomes aware of and knows his own cognitive system, his own cognitive activity, his own tools of cognition and manages its proper functioning, regulates and improves it (Azevedo, 2020).
Main perspective	Mentoring system principles: mutual trust; mutual respect; openness; availability; accountability; two-way feedback; developmental orientation (including metacognitive); self-improvement (Mullen and Klimaitis, 2021).	Principles of metacognitive approaches: self-empowerment; comprehension orientation; metacognitive development orientation, which fosters transfer of learning; self-improvement (Fan et al., 2022).
The axiological perspective	Values promoted: interdependence, cooperation, empathy, positive attitude and interaction, learning, development, improvement, growth, maturity, independence, autonomy (Shanks et al., 2022).	Values promoted: (self)learning, (self)development, (self)improvement, maturity, autonomy, self-regulation (Sahin et al., 2023).
The experiential perspective	Involves learning from the experience of others and from one's own experience (Lester et al., 2019).	Is based on one's own learning experiences and awareness of cognitive functioning and subjective knowledge (perceptions, beliefs, feelings, emotions) (Morgenroth et al., 2021).
The subjective perspective	The focus is on the mentee's active involvement in complex communication with the mentor. Intersubjectivity is valued at the philosophical level (community of attitudes, views, beliefs, points of view, experiences, etc.) (Schriever and Grainger, 2019).	The emphasis is on the active role of the subject in the conscious realization of cognitive processes, in experiencing his own subjectivity, through self-awareness of his own cognition, through "turning to oneself", to control and regulate cognitive and affective processes, to achieve self-management, self-mentoring (dos Santos Kawata et al., 2021).

Table 1. (*Continued*).

Element of analysis	Mentoring	Metacognition
The (inter)relational perspective	Professional and personal support system for a person (Toh et al., 2022). A dynamic educational relationship between mentor and mentee, a learning relationship (cognitive, metacognitive and non-cognitive-affective, psychomotor, social), generally focused on the long-term career development of the mentee. Multidimensional interrelationship. Individual and collective professional adaptation and learning in the context of interaction with the mentor.	Metacognitive learning, which involves communication with the self, the inner self, and conscious metacognitive training (Viana-Sáenz et al., 2021). A tool for regulating and self-regulating one's cognitive activity in order to develop the competence to learn to learn.
The reflective perspective	(Self-)reflection on cognition/cognition and cognitive and developmental processes (reflection can be structured/ guided, semi-structured/semi-guided, unstructured/ unguided/ open) (Toh et al., 2022).	(Self)reflection on cognition/cognition and cognitive processes, metacognitive reflection (related to current performance, and anticipation of future performance) (Hiver et al., 2021).
The procedural perspective	The assisted process, through which the mentor helps the beginner to achieve certain performances, to develop himself, to develop self-confidence, to become independent, autonomous and mature, a self-mentor (Waite et al., 2020). Instrumental process, organised to achieve certain performances, through an assisted process of stimulation, guidance, orientation, based on feedback, reinforcement, stimulation of competition, etc. (Waite et al., 2020).	Metacognitive process, which values knowledge "over" and "about" knowledge in order to control, regulate and improve cognitive and affective processes (Teng, 2019).
The instrumental perspective	Powerful and effective tool for professional and personal training and development (Liu et al., 2021). Tool to achieve performance.	Cognitive tool for organizing, planning, structuring, regulating, improving and making cognitive processes and knowledge more efficient (Vargas-Isidro et al., 2023). Tool to achieve performance.
The training perspective	Involves strategies, which involve cognitive and affective training, in contexts of reflective and stimulating learning, through (self)questioning, searching, analysis of own behaviour, problem identification, solution, etc. (McConnell et al., 2019).	Involves metacognitive training to rationalise and streamline learning processes and reduce the likelihood of incidental, implicit learning (Sulaiman et al., 2021).
The finalist perspective	The development of the mentee is sought through the development of professional, personal, social and transversal skills (Gisbert-Trejo et al., 2019).	It aims at self-development of the learner through the formation of metacognitive skills (Langdon et al., 2019).

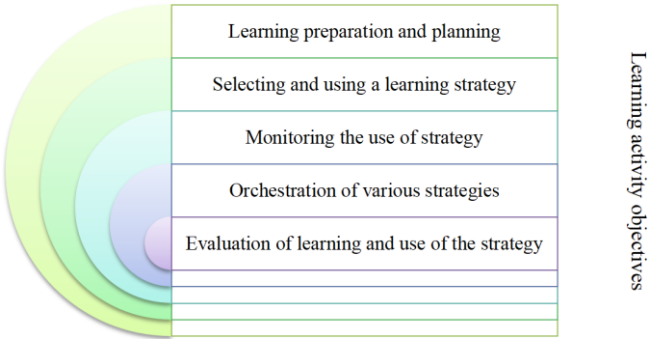

Figure 1. Components of metacognition (after Anderson, 2002).

Applying the same reasoning, in **Figure 2**, we provide a symmetrical model for the components of the mentoring processes, which in our view are: preparation and planning of mentoring activities, selection of certain cognitive, metacognitive and non-cognitive approaches and tools, monitoring of the chosen approaches and tools, orchestration of the different approaches and tools, evaluation of the approaches and tools used. Also, from a teleological perspective, all these components are subordinate to the objectives pursued in the mentoring activities.

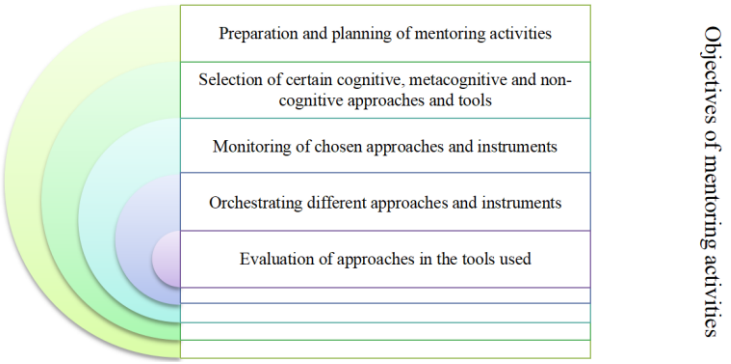

Figure 2. Components of mentoring processes (own design).

To capture the relationship between mentoring and metacognition, we define mentoring as a complex, multidimensional, inclusive process of guiding, influencing and supporting-cognitive, metacognitive and non-cognitive (affective, psychomotor and social)—a person at a certain point in his/her professional development (beginning, development and professional evolution towards the end of his/her career). As one can see in **Figure 2**, the mentoring process involves practicing and educating metacognitions, which, as a complex process, makes possible:

1) metacognitive development of the mentee, who, being aware of his/her own cognitive functioning, develops metacognitive reflection, metacognitive confidence; metacognitive acquisitions (knowledge, strategies, experiences, metacognitive skills);
2) metacognitive development of the mentor, who, by paying attention to metacognitive issues, diversifies his metacognitive strategies and improves his metacognitive accuracy.

To capture the relationship between metacognition and mentoring, we start from the above definition and **Figure 2** and conclude that metacognition is a constructive component of mentoring, a dimension of mentoring processes and activities. The metacognitive dimension of mentoring refers to metacognitive knowledge, the acquisition of metacognitive acquisitions (knowledge, strategies, experiences, skills), the practice and education of metacognitions, all of which can be assimilated to self-mentoring.

4. Findings

As a complex system for supporting people at different stages of their career development, mentoring also integrates a metacognitive dimension, since it is necessary to support and educate the mentee from a metacognitive point of view and to value his/her particularities from a metacognitive perspective: the specifics of cognitive functioning; strengths and weaknesses of the functioning of the cognitive system; difficulties in cognition and learning; learning experiences; previous cognitive, cultural, attitudinal acquisitions; the ways in which they carry out metacognitive training, metacognitive education and metacognitive learning, etc.

Metacognitive educability of the mentee is a feature of his/her personality, which designates his/her readiness to be educated or to (self-)educate from the metacognitive point of view, the possibility to be receptive to the metacognitive support system, to

the shaping influences of the metacognitive training for the permanent application of metacognitive strategies, carried out under the mentor's coordination.

The process of metacognitive education makes it necessary to create a:

a) Metacognitive training, understood as a higher type of training, which involves guidance from mentors on the metacognitive dimension of the mentee's learning. Metacognitive training is strategic training, whereby mentees are supported to reflect cognitively and metacognitively, to learn, to achieve information and knowledge management. In metacognitive training a central place is given to the acquisition and practice of metacognitive strategies, which contribute significantly to the formation of metacognitive skills and to the improvement of learning performance (Bocoș et al., 2021).

b) Metacognitive learning, understood as a type of learning in which the person becomes aware of his/her metacognitive activity (so that it can be observed, analysed, adopted, improved, etc.), understands the contents of learning (cognitive, action, affective-attitudinal), transfers acquisitions, knows himself/herself better, actively, independently and autonomously manages his/her own learning (Bocoș et al., 2021).

Effective metacognitive training and metacognitive learning require the consideration of some general recommendations, which in our view are those in **Table 2**.

Table 2. Recommendations for metacognitive education in the context of mentoring.

No.	Recommended approach (for the mentor)	Benefits (for the mentee)
1)	To make visible the metacognitive dimension of mentoring activities, metacognition as a component of mentoring.	Stimulating metacognitive reflection, awareness of metacognitions and their importance in knowledge management. Reflective training (cognitive and metacognitive). Cultivating a reflective attitude (cognitively and metacognitively).
2)	The explicit acquisition of meta-assets, as a result of the existence of intentional steps taken by the mentor (thus the implicit acquisition of meta-assets, which is possible under the conditions of mentor-mentee collaboration, is not sufficient).	Explicit teaching of metacognitions (to students), accompanying explanations with cognitive as well as metacognitive support, encouraging students to use cognitive as well as metacognitive strategies so that they are always cognitively and metacognitively supported to learn metacognitive acquisitions.
3)	Metacognitive training to facilitate metacognitive learning.	Restructuring and refining mental schemas. Development of metacognitive acquisitions. Transfer of metacognitive acquisitions to other learning and knowledge situations.
4)	Involvement in various metacognitive learning situations.	Living varied metacognitive experiences. Enriching metacognitive knowledge.
5)	Harnessing systemic vision in metacognitive education.	In-depth understanding of content. Achieving purposes corresponding to higher taxonomic levels (analysis, evaluation, creation). Stimulating responsibility in learning and knowledge. Increasing motivation for involvement in mentoring programmes.
6)	Framing metacognitive education within cognitive education, given the indissoluble link between them, connecting cognitive intelligence with metacognitive intelligence.	Metacognition is harnessed as a tool to anticipate, monitor, control, evaluate and regulate cognition and thus to achieve the performance anticipated by the learning and knowledge activity objectives. Awareness that cognition and metacognition are simultaneous processes, neither the teacher nor the learner can objectively assess the learner's cognitive level in the absence of a good representation of one's own metacognitive functioning. The operational and tandem use of the terms cognition and metacognition.

To educate mentees' metacognitions, mentors are interested in conducting careful, thorough, in-depth, "molecular analyses" of the cognitive operations that mentees perform. The purpose of these analyses is to contribute to the mentee's metacognitive

development, to develop and refine his/her metacognitive acquisitions (knowledge, strategies, experiences, metacognitive skills). Systematic modelling influences on the mentee's metacognitive dimension and the implementation of metacognitive education provide the prerequisites for the development of metacognitive intelligence. This expresses the intellectual capacity that enables the person to effectively manage his/her own cognitive system, his/her own cognitive activity, his/her own knowledge, to select, activate and combine different knowledge tools, ensuring their regulation and improvement.

A teacher with metacognitive intelligence is able to practice metacognitive pedagogy, i.e., to value metacognition and to develop metacognition, self-control and self-directed learning skills based on self-cognitive mechanisms. For example, teaching methodology is only an external support in the mental construction of knowledge, it can only be effective if it is internalized through metacognitive practices. Therefore, the metacognitive process is an interactive process between the learner and the learning environment, and the use of active and active-participatory methods for cognitive and metacognitive practice contributes to increasing independence in learning and acquiring autonomy in learning (Bocoș, 2013).

First and foremost, we uncovered that the metacognitive educability of the mentee is a pivotal aspect of their readiness to engage in metacognitive learning. This readiness is fundamental in shaping their receptivity to the metacognitive support system provided by mentors and their ability to apply metacognitive strategies with guidance. Our research aligns with the work of Bocoș et al. (2021), which underscores the importance of metacognitive training in fostering the development of metacognitive skills and enhancing learning performance.

Additionally, our findings emphasize the significance of metacognitive learning, a process that fosters self-awareness of metacognitive activity and enables individuals to actively manage their own learning. This aligns with Bocoș (2021), who highlights the importance of individuals becoming aware of their metacognitive activity and using it to improve their learning experiences.

The recommendations we propose in **Table 2** provide a practical framework for metacognitive education within mentoring. These recommendations address the role of mentors in making the metacognitive dimension of mentoring visible, explicitly teaching metacognitive assets, facilitating metacognitive training and learning, and harnessing a systemic vision in metacognitive education. Our study concurs with these recommendations, which we believe are essential for effective metacognitive education within mentoring programs.

In comparing our findings with past studies, we observe consistency with the existing literature that highlights the importance of metacognition in education and learning. Our research reinforces the notion that metacognitive training and learning are essential for enhancing cognitive and metacognitive skills and improving overall learning performance, which aligns with the work of Bocoș et al. (2021).

Moreover, our study extends this understanding by emphasizing the role of mentors in the metacognitive development of mentees. This emphasis on mentor-led metacognitive education represents a novel contribution to the field, as it underscores the significance of mentors in guiding mentees through the metacognitive dimension of their learning journey.

In conclusion, our research underscores the importance of metacognitive education within mentoring and provides a practical framework for its implementation. Our findings align with past studies that emphasize the role of metacognition in learning and skill development, while also contributing a unique perspective on the mentor's role in metacognitive education. This research has the potential to inform mentoring programs and educational practices, ultimately enhancing the effectiveness of mentor-mentee interactions and fostering the development of metacognitive skills in learners.

5. Discussion

One of the basic principles of mentoring refers to the development of metacognitive skills in the mentee, through self-questioning, self-reflection, self-analysis and self-awareness, based on a model of reflection that becomes appropriate in the professional, personal and social development of both the mentee and the mentor.

In order to design and carry out mentoring programs to ensure the gradual and holistic development of the mentee, the mentor assists, guides, influences and supports the mentee's cognitive, metacognitive and non-cognitive (self)development. Through the specific ways in which the mentor builds the support system for the mentee, he/she aims to achieve progressive degrees of independence, to carry out various independent and autonomous activities (including metacognitive) and to reach the stage of cognitive and educational autonomy.

Given the gradual, step-by-step nature of the mentoring process, the extent to which the mentee is dependent on the mentor in making professional and personal decisions gradually decreases as the volume and complexity of the mentor's shaping influences diminish, with the mentor playing a less and less directive role to a non-directive, facilitator role, discreetly guiding and coordinating the mentee's activity.

As there is a need to graduate, i.e., gradually reduce the mentor's interventions, there are a series of stages of professional and transversal competences on which the mentee is placed, each stage preparing the next and providing the necessary prerequisites. Naturally, the various stages of professional and personal development cannot be gradually achieved without the mentee's activation, i.e., without their conscious, active, interactive and full participation and involvement (cognitive/intellectual, psychomotor, affective and volitional) in the mentoring program.

Thus, we can speak of a mentoring scaffolding system, which highlights the fact that the mentor's shaping influences provide a solid 'scaffolding' for the mentee, with the help of which the mentee continues the 'construction' of knowledge:

1) The mentor "builds" a "scaffold", taking into account the mentee's current professional level, professional, psychological, communicational profile, etc. At the same time, however, the mentor will take into account the extent to which the mentee will be able to progress with the mentor's help, gradually "climbing" to higher levels of professional, personal and social development. 'Scaffolding' occurs when the mentor closely assists the mentee and is able to control, monitor and evaluate certain variables of the mentoring situation on purpose, in order to enable the mentee to progress and ultimately achieve the proposed outcomes

themselves, which they would not be able to achieve without assistance. In this way, the 'scaffolding' intentionally allows for gradual support, on the basis of which the mentee will progress and develop cognitive skills, metacognitive skills and transversal skills. Awareness and internalization of the successes achieved thanks to the mentoring "scaffolding" encourages mentees, gives them self-confidence, motivates them, encourages them, supports them in a comprehensive way.

2) At some point, the "scaffolding" that has been built is slowly removed, and the mentee will then be able to carry out the activities initially carried out under the guidance of the mentor on their own and refine their behaviors, becoming, in effect, a self-mentor.

The concept of "scaffolding" in the context of mentoring and metacognition is fundamental to understanding how mentors and educators can effectively support learners in their cognitive and metacognitive development. Scaffolding refers to the support and guidance provided by mentors or educators to help learners progress from their current level of competence to a higher level of skill or understanding.

Imagine a scenario in which a mentor is working with a student who is struggling with a complex problem-solving task. The mentor's role is to provide the necessary support to help the student develop problem-solving skills independently. Initially, the mentor may offer explicit guidance and instruction, breaking down the task into manageable steps. This process aligns with Vygotsky's Zone of Proximal Development (ZPD), where learners can perform tasks with support that they couldn't accomplish alone. As the student gains confidence and competence, the mentor gradually reduces the level of support, allowing the student to take on more responsibility for their learning. This progressive withdrawal of support is a key feature of scaffolding, as it empowers the student to become a self-regulated learner, capable of tackling similar challenges autonomously. Incorporating metacognition into the scaffolding process involves helping students become aware of their own thought processes and strategies. For example, a mentor can encourage the student to think about how they approach problem-solving tasks, reflecting on their strengths and weaknesses. Over time, the student can use these metacognitive skills to monitor their own learning, making adjustments and improvements as needed.

In a university setting, academic advisors can employ metacognitive training to enhance students' academic success. For example, an advisor might work with a struggling student to set specific academic goals. The student is encouraged to monitor their progress regularly, reflect on their study habits, and adjust their strategies as needed. This process fosters metacognitive skills such as self-monitoring and self-regulation, ultimately leading to improved academic performance. In a career mentoring context, a mentor can guide a young professional in metacognitive reflection. The mentor may encourage the mentee to assess their career goals, strengths, and weaknesses, and to identify areas for growth. Through this metacognitive process, the mentee gains a deeper understanding of their professional development needs and can make informed decisions about their career path. These scenarios serve as practical illustrations of how metacognitive training can be woven into mentoring and education. They demonstrate the tangible benefits of metacognition in fostering self-awareness, critical thinking, and autonomous learning.

Our discussion underscores the unique perspective we bring to the field of mentoring and metacognition. While our research aligns with the fundamental principles of mentoring, such as the development of metacognitive skills through self-questioning and self-reflection, we introduce a novel concept, the "mentoring scaffolding system."

This system highlights the transformative role of mentors in shaping the mentee's cognitive, metacognitive, and non-cognitive development. It goes beyond the traditional mentor-mentee relationship by emphasizing the gradual reduction of mentor interventions, allowing the mentee to progress towards cognitive and educational autonomy.

The "scaffolding" metaphor is a distinctive feature of our work, representing the intentional support provided by mentors to enable mentees to reach outcomes independently. The removal of this scaffolding marks a crucial transition, as mentees become self-mentors, capable of self-directed learning and decision-making.

In contrast to past research, our mentoring scaffolding system offers a practical framework for mentor-led development. It provides a structured approach that considers the mentee's current level and facilitates their progression to higher levels of professional and personal development. By focusing on the deliberate support and gradual reduction of this support, our approach empowers mentees to develop cognitive, metacognitive, and transversal skills with increasing independence.

Our contribution lies in the systematic integration of metacognitive development within the mentoring process and the emphasis on the mentee's active participation and involvement. This unique perspective not only enriches the field but also provides a comprehensive understanding of how mentoring can be a transformative experience for mentees, equipping them with the skills and autonomy needed to excel in their professional and personal lives.

In summary, our work introduces a fresh paradigm in mentoring, which we believe will open doors to further exploration and innovation in this field. Our "mentoring scaffolding system" concept offers a novel approach to mentoring that considers both the mentee's development and the mentor's role in facilitating their growth. This unique thinking has the potential to shape mentoring programs, making them more effective and impactful for mentees' holistic development.

6. Conclusion

The various analyses carried out in relation to the concepts of metacognition and mentoring lead us to questions such as: Is a culture of metacognition necessary? We believe that the answer to this question can only be in the affirmative, and in support of this we make the following arguments:

1) Awareness and development of cognitive and metacognitive acquisitions ensure permanent improvement of academic (mentees'), professional, personal and social performance, independence and autonomy in knowledge, refinement of mentees' professional and transversal skills.
2) The existence of strategies, means and tools for mentoring action makes it possible for mentees to cultivate the assumption, responsibility, accountability, the effort to "know about knowledge", the courage to be a person willing to learn,

to know, to (self-)train.

3) Cultivating metacognition makes it possible to move from knowledge to understanding and then to wisdom, metacognition being thinking in and about thinking, a wisdom of reason, to relevant value judgments.
4) Since metacognition involves monitoring learning, cognition, understanding, the terms cognition and metacognition are used in pairs, cognitive practice accompanied by metacognitive practice contributes to increased independence in learning and the acquisition of autonomy in learning, as well as the crystallization of cognitive and metacognitive intelligence.
5) Referring to current educational paradigms, we can state that metacognitive education is a constructive component of effective personal education, in the spirit of lifelong learning and life wide learning paradigms.
6) Referring to the current direction of approach and research, which highlights that the boundaries between perceiving, thinking and acting no longer exist, we draw relevant consequences regarding metacognition. Thus, intelligent behavior depends not only on abstract cognitive operations, but above all on how the brain acts in relation to them, on the morphological structure of the individual and on the physical and social context; it is generated by the relationship: body ↔ brain ↔ environment. Therefore, the development of a person's cognitive system occurs through self-organization and is a consequence of the permanent interactions and interdependencies between brain, body and environment. These interdependencies form the basis of a new 'cognitive architecture', which values metacognition and makes it necessary to know the mechanisms of metacognitive development, self-management and the evolutionary processes that the person goes through in order to perform in the field of specialization.

Another question we aim to answer is, "What are the curricular implications of metacognition culture?" We believe that, from a curricular point of view, given the recent scientific acquisitions, it is necessary to introduce metacognition in the educational curriculum, promoting a new educational paradigm: learning with, through and for metacognition. This will enable education to be geared towards metacognitive learning, which in turn will provide society with individuals who are well-prepared, efficient, independent in their thinking and aware of themselves and others. Metacognitive education is only possible if models of education/mentoring/training based on an integrative approach to divergent, flexible and creative thinking and metacognition (not imitation, not empirical intuition) are created.

The curricular dimension leads us to the didactic dimension, in relation to which, we formulate the question: What are the didactic implications of metacognition culture? In our view, the main didactic implications of metacognition culture are:

1) The value of metacognitive mediation, understood as the action of the mentor/teacher to activate the mentee/mentee to achieve self-management in knowledge;
2) The affirmation of the role of the mentor/teacher as a metacognitive mediator, i.e., as a facilitator of metacognitive acquisition);
3) Affirming the role of the mentee/mentee as an agent who continuously monitors his/her progress, reflects metacognitively, evaluates reflectively, is capable of

self-mentoring;

4) Taking over and maintaining control over thinking, over the cognitive system by the mentee/learner, i.e., ensuring (self-)accountability, (self-)monitoring, (self-)regulation, personalization of learning, evaluation and enrichment of cognitive and metacognitive acquisitions, which will ensure safe adaptation to the information society.

In conclusion, we affirm that metacognition contributes to the (self)formation of the person only if it is authentically and systematically integrated in the mentoring and educational processes, if there is a culture of it, a culture of observing, analyzing and operationalizing the life of the mind, in order to know yourself you as a person who learns, who knows, who educates and trains, and to know others, with honesty, objectivity and responsibility.

While the integration of metacognition into mentoring and education offers numerous benefits, it is essential to acknowledge the challenges and limitations that educators, mentors, and learners may encounter in this process. Understanding and addressing these challenges is crucial for the successful implementation of metacognitive strategies in educational contexts.

One significant challenge is the resistance to change. Educational institutions and practices often follow established routines and traditions. Introducing metacognition as a fundamental component of teaching and mentoring may be met with skepticism or reluctance. Educators and mentors must be prepared to navigate this resistance and advocate for the benefits of metacognition in enhancing learning outcomes and self-awareness.

Time constraints represent another practical challenge. Teachers and mentors have limited time to cover the required curriculum and content. Integrating metacognitive training may seem like an additional demand on their already busy schedules. To address this challenge, it is essential to demonstrate that metacognition can enhance learning efficiency, leading to better long-term results and reduced time spent on relearning or correcting misconceptions.

Furthermore, the need for specialized training poses a challenge. Educators and mentors may require additional professional development to effectively implement metacognitive strategies in their practice. This includes understanding metacognitive theories, learning how to guide learners in metacognitive reflection, and creating a supportive learning environment. Access to such training and resources may vary, and addressing this limitation is essential for ensuring equitable opportunities for all educators and mentors.

An additional limitation to consider is that metacognitive approaches may not have uniform effects on all learners. Students with diverse learning profiles, backgrounds, and abilities may respond differently to metacognitive interventions. Tailoring metacognitive support to meet individual needs is a complex but necessary task for educators and mentors.

Thus, recognizing and discussing these challenges and limitations is a vital part of the conversation surrounding the integration of metacognition into mentoring and education. While these obstacles may be present, addressing them thoughtfully can lead to more effective and inclusive educational practices, ultimately benefiting learners in their journey towards self-awareness and enhanced cognitive skills.

In reflection on the shortcomings of this study, it is important to acknowledge that our research primarily focuses on the theoretical and conceptual aspects of metacognition within the context of mentoring. While our work provides valuable insights into the integration of metacognition in mentoring, it is essential to recognize that practical implementation and empirical validation of these concepts are areas that warrant further exploration.

Future research endeavors should prioritize the empirical testing of the metacognitive concepts and principles proposed in this study. Longitudinal studies and experimental designs are needed to assess the effectiveness of metacognitive interventions within mentoring programs. Moreover, investigating the diverse contexts in which metacognitive education can be applied, such as formal education, professional development, and lifelong learning, will broaden the scope of research in this area.

Additionally, the cultural and contextual factors influencing the adoption and impact of metacognition within mentoring should be explored. Comparative studies across different educational and cultural settings can provide a more comprehensive understanding of the nuances and variations in the implementation of metacognition.

Furthermore, research into the development of practical tools and resources for mentors and mentees to facilitate metacognitive education is essential. The creation of comprehensive mentoring programs that integrate metacognitive practices, alongside traditional mentoring activities, can offer a holistic approach to personal and professional development.

In conclusion, while this study lays the theoretical foundation for the integration of metacognition in mentoring, future research endeavors should focus on empirical validation, practical implementation, and contextual considerations. By addressing these aspects, we can further enhance the effectiveness of metacognitive education within mentoring, fostering independent and self-aware learners equipped to thrive in the information age.

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