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# University Professors' Feedback as an Emotional–Cognitive Catalyst for Learning and Memory: A Qualitative Study of Pre-Service Teachers' Experiences

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## ABSTRACT

**Objective**: University professors feedback is a central component of pre-service teacher education, influencing not only performance but also emotional, cognitive, and relational experiences of learners. Despite extensive research on feedback, little is known about how pre-service teachers experience feedback as an emotional–cognitive phenomenon that affects learning, memory, and professional identity. This research aimed to conceptualize university professors feedback as an "emotional–cognitive catalyst" and explore its role in shaping learning, memory consolidation, and professional identity in pre-service teachers.

**Method**: A qualitative approach grounded in Van Manen's (2016) interpretive phenomenology was employed. Semi-structured interviews were conducted with pre-service teachers at Farhangian University. Data were analyzed to identify themes related to emotional, cognitive, relational, and memorization aspects of feedback experiences.

**Results**: Analysis revealed that feedback functions as a multidimensional and existential event and meaning-making and relational feedback facilitated deep learning, long-term memory consolidation, intrinsic motivation, and professional self-image development. Conversely, controlling or harmful feedback led to superficial processing, reduced motivation, and disruption of educational memory. The findings highlight the mediating role of feedback in linking emotion, cognition, and professionalization.

**Conclusions**: Well-structured, emotionally supportive feedback is essential for enhancing learning outcomes and professional identity in teacher education. Attention to both content and relational quality is crucial for feedback to serve as an effective emotional–cognitive catalyst, suggesting practical strategies for teacher training and future research directions.

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## Introduction

In recent decades, the dominant paradigms in learning research have increasingly moved away from purely linear and cognitive-based perspectives towards integrated approaches that view learning as an interactive process between cognitive, emotional, and social mechanisms. Growing evidence in the fields of educational psychology, educational neuroscience, and higher education suggests that emotion is not a side effect, but a structural component in the formation of attention, information processing, meaning-making, and consolidation of learning in memory (Lang et al., 2022; Mageed, 2025; Rahimi et al., 2025). In this context, university professors' feedback, as one of the most central teaching practices, plays a role beyond performance modification and can act as an emotional-cognitive catalyst to influence the quality and persistence of learning.

Feedback, when provided in the context of teacher-student interaction, simultaneously carries cognitive messages (about performance level, error, and strategy) and emotional messages (about worth, competence, and belonging). Studies also demonstrate cognitive differences between novice and experienced teachers and emphasize that effective feedback must be tailored to the cognitive level and professional experience of pre-service teachers to maximize its impact on learning and memory (Azizi et al., 2023). Empirical research has shown that emotional feedback can provide more optimal conditions for deep learning and knowledge transfer by reducing confusion, increasing intrinsic motivation, and improving the learner's perception of the educational agent (Lang et al., 2022). Also, structured and interactive feedback is significantly related to learners' cognitive, behavioral, and emotional engagement (Al-Obaydi et al., 2023), which implies the multidimensional role of feedback in regulating the learning experience. Recent research shows that the use of metacognitive strategies can, in addition to improving academic performance, increase learners' motivation and self-efficacy, and provide the context for active participation and deep cognitive processing (Soroosh et al., 2025). These findings indicate that teacher feedback, when combined with metacognitive skills, can effectively enhance the emotional and cognitive components of learning.

In teacher education systems, the importance of this issue becomes more prominent because pre-service teachers are not only learners of content, but also shaping their future professional identities and teaching patterns. Their lived experience of teachers' feedback implicitly establishes patterns of educational relationships, assessment methods, and error handling in their minds (Solimannejad, 2025). Studies have shown that teachers' teaching styles may differ from their preferences, and awareness of actual and desired teaching styles can help design effective feedback tailored to the learner's needs (Kadim Rahumi & Alavinia, 2024). This issue is particularly important in teacher education because teacher feedback should be aligned with the pre-service teachers' learning styles and professional preferences. Domestic qualitative studies have shown

that effective professors facilitate the professional empowerment of pre-service teachers through supportive interaction, understanding the psychological dimensions of learning, and providing constructive feedback (Solimannejad, 2025). In this regard, interactive feedback models have been introduced as the most effective feedback methods in higher education; models that can reduce resistance to feedback and create positive individual and organizational outcomes (Arab et al., 2023). From an emotional perspective, numerous studies have emphasized the role of emotion regulation, emotional intelligence, and the quality of educational relationships in learning. Hamid (2025) showed that teachers' and professors' emotional intelligence can enhance learners' engagement, motivation, and academic performance by creating healthy relationships and safe learning environments. Correspondingly, teachers' emotional and social competencies have been recognized as effective prerequisites for providing meaningful and relationship-oriented feedback, and professor feedback can help strengthen pre-service teachers' emotional capabilities and foster a positive generation (Heydariyezadeh et al., 2023).

Mageed (2025) also argues that emotional components are a fundamental prerequisite for any effective cognitive processing and without them, even the most advanced cognitive strategies will have limited effectiveness. Conversely, the lack of supportive feedback and the experience of academic failure can lead to emotional frustration, reduced motivation, and decreased performance (He & Joy, 2026). At the cognitive and neurological level, findings from educational neuroscience indicate that meaningful emotional experiences play a decisive role in the consolidation of learning through the activation of attention and memory networks (Rahimi et al., 2025). From this perspective, teacher feedback is not only an educational stimulus, but also an emotional event that can leave a lasting imprint on the learner's memory. Research that focuses on improving memory and the teaching-learning process through new educational strategies, such as gamification (Dartaj, 2024) or flipped learning (Khazaei et al., 2025), implicitly emphasizes the role of positive emotional experiences in learning, although teacher feedback has been less independently conceptualized in these studies. Despite the relative richness of the research literature, the majority of existing studies have either examined the relationships between variables using quantitative approaches and structural modeling (Eghbali et al., 2025; Nadav et al., 2026), or have focused on the educational consequences of technological innovations (Dehghan-Manshadi et al., 2024; Ebrahimzadeh & Kashfi, 2024). Although these studies have helped to explain macro-mechanisms, they have rarely addressed pre-service teachers' lived experience of teacher feedback and the emotional-cognitive meanings embedded in it. Existing qualitative research has also focused mainly on teachers' learning while teaching (Babaee & Qaderi, 2025), internship achievements (Ebrahimi & Mohammadbabui, 2025), or teachers' emotional competencies (Heydariezadeh et al., 2023), while the role of teacher feedback as a mediating factor in the connection between emotion, cognition, learning, and memory has been less phenomenologically explored.

Furthermore, despite the proliferation of research on human feedback in emerging areas such as reinforcement learning with human feedback (Li et al., 2023), there is a substantial gap between these theoretical approaches and the understanding of learners' human experience in real educational contexts; a gap that highlights the need to pay attention to learners' meaning, feeling, and interpretation of feedback.

Accordingly, the present study, by adopting a qualitative approach and focusing on the lived experience of pre-service teachers at Farhangian University, attempted to conceptualize university professors' feedback as an "emotional-cognitive catalyst" in the learning and memory process. This study sought to explore the perceptions, feelings, and meanings attributed to educational feedback, to gain a deeper understanding of its role in lasting learning and the formation of pre-service teachers' professional identities, and thereby fill the gap in the research literature on teacher education at the theoretical and applied levels.

## Materials and Methods

The present study was conducted with a qualitative approach within the framework of interpretive phenomenology. Interpretive phenomenology, focusing on understanding and interpreting individuals' lived experiences, allows for deep exploration of the meanings hidden in human experiences and is considered an appropriate approach for studying phenomena that are emotional, cognitive, and meaning-making in nature. Since the aim of this study was to understand pre-service teachers' lived experiences of teacher feedback and its role in their learning and memory, Van Manen's interpretive phenomenology approach was chosen as the methodological framework.

### *Participants*

The research field consisted of pre-service teachers at Farhangian University who were studying elementary education and had experienced receiving educational feedback from their professors in theoretical and practical courses. A total of 33 female pre-service teachers, aged between 20 to 24 years, participated in the study. Although data saturation was reached earlier, the researchers continued sampling to ensure maximum variation and depth of experiential meanings. This allowed for a richer phenomenological interpretation of the emotional–cognitive dimensions of feedback across diverse lived experiences. The relatively larger sample size strengthened the interpretive validity of the findings by revealing both shared essences and nuanced variations in participants' feedback experiences.

Participants were selected using purposive sampling, in such a way that individuals were selected who had the ability to describe their experience in a rich, reflective, and informed manner. The sampling process continued until semantic saturation was achieved, meaning that after

conducting several consecutive interviews, new data did not lead to the emergence of new meaning in relation to the phenomenon under study.

### *Instruments*

Data were collected through semi-structured in-depth interviews. The interviews focused on the pre-service teachers' lived experience of teachers' instructional feedback, and the questions were designed to reveal the emotional, cognitive, and memorization dimensions of this experience. Sample interview questions included: What was the feedback that had the most impact on your learning? What emotions did you experience when receiving teacher feedback? Did teacher feedback help you understand or remember something more deeply? How? The interviews were conducted with the informed consent of the participants, recorded, and then transcribed verbatim.

### *Data Analysis*

Data analysis was conducted based on Van Manen's (2016) interpretive phenomenological approach. In this process, the researchers extracted semantic themes by moving back and forth between the interview text and the participants' entire lived experience. The analysis steps included repeated immersion in the data text and reflective reading of the interviews, identifying meaningful phrases and statements related to the feedback experience, extracting initial themes focusing on emotional, cognitive, and memorization dimensions, interpreting themes in relation to the nature of the lived learning experience, and integrating themes to achieve an overall semantic structure of the phenomenon. This analytical process was simultaneously descriptive and interpretive in order to obtain a deeper understanding of the meanings hidden in their experience while preserving the participants' voices. To ensure the validity and reliability of the findings, the criteria proposed by Lincoln and Guba were used.

Validity was ensured through the researchers' prolonged engagement with the data, repeated review of interviews, and return to participants to confirm interpretations. Reliability was achieved through careful documentation of the research steps and data analysis process. Confirmability was achieved by recording the researchers' reflective notes and separating raw data from interpretations. Also, to increase transferability, a rich and detailed description of the research context, participants, and study process was provided. Research ethics were observed at all stages. Participation in the research was voluntary, and informed consent was obtained from participants before interviews were conducted. Pseudonyms were used to maintain confidentiality, and all data were used solely for research purposes.

## Results

Data analysis focused on the lived experiences of pre-service teachers in relation to educational feedback. The findings indicate that, from the participants' perspectives, feedback was experienced

not merely as a technical or evaluative practice, but as a meaningful learning situation in which emotional responses, cognitive engagement, relational perceptions, and memory processes were simultaneously involved. In the participants' narratives, feedback moments were described as influential experiences that shaped their learning trajectory, motivation, and attitudes toward the teaching profession.

**Table 1. Levels of pre-service teachers' lived experiences of university professors feedback**

| Level of Lived Experience | Core Theme | Empirical Manifestations in Sample Narratives |
|---|---|---|
| **Emotional** | Experience of Affective Arousal | Feelings of encouragement, anxiety, shame, motivation, or worthlessness |
| **Cognitive** | Guidance of Understanding | Clarification of the learning path or confusion regarding expectations |
| **Relational** | Quality of Teacher–Student Relationship | Sense of being seen, supported, distant, or subject to power imbalance |
| **Existential** | Professional Self-Evaluation | Reinforcement or undermining of the "becoming a teacher self-image |

Table 1 shows that feedback in the experience of pre-service teachers is not a single-dimensional event. Students experience feedback not only as an educational message, but also as an emotional-relational and even existential experience. This finding is consistent with van Manen's view that learning is an event in the lifeworld, not simply the transmission of information.

**Table 2. Deep semantic structures of university professors feedback**

| Semantic Structure | Phenomenological Description | Educational Implication |
|---|---|---|
| **Meaning-Making Feedback** | Feedback that highlights effort, understanding, and the growth trajectory | Deep and internalized learning |
| **Controlling Feedback** | Score-oriented and directive feedback | Instrumental and minimal learning |
| **Harmful Feedback** | Humiliating or indifferent expressions | Motivation blockage |
| **Relational Feedback** | Feedback delivered with respect and dialogue | Psychological safety and engagement |

The semantic structures extracted in Table 2 show that the "how" of feedback is as important as the "what" of that. From an interpretive phenomenological perspective, these semantic structures indicate that feedback operates as a catalyst by reorganizing learners' emotional orientation toward learning and shaping their cognitive engagement. Meaning-making and relational feedback trigger reflective awareness and intentional learning, whereas controlling and harmful feedback interrupt this process by narrowing learners' horizon of meaning. Thus, feedback does not merely transmit

information but actively configures the emotional–cognitive conditions under which learning and memory emerge. pre-service teachers experience feedback as learning-generating when they receive it in the context of a human and meaningful relationship; otherwise, feedback is reduced to a controlling or even damaging action.

**Table 3. Cognitive–memory outcomes of feedback experiences**

| Type of Feedback Experience | Cognitive Processing | Effect on Learning Memory |
|---|---|---|
| **Clear and Supportive Feedback** | Deep and reflective processing | Stable consolidation of content |
| **Ambiguous Feedback** | Surface-level processing | Short-term retention |
| **Negative Emotional Feedback** | Cognitive disruption | Active forgetting or omission |

According to Table 3, the findings show that the educational memory of pre-service teachers is highly emotion-driven. Feedback experiences that are accompanied by intense negative emotion not only do not lead to learning, but sometimes lead to the elimination or suppression of the learning experience; in contrast, positive explanatory feedback provides the basis for long-term consolidation of learning. These findings suggest that memory is not a neutral cognitive storage system but is deeply intertwined with emotional experience. Feedback accompanied by supportive emotions facilitates encoding and consolidation, while emotionally negative feedback disrupts attention and leads to avoidance or suppression of learning memories. This reinforces the conceptualization of feedback as an emotional–cognitive catalyst that determines not only what is learned, but also what is remembered or forgotten.

**Table 4. Phenomenological nature of university professors feedback**

| Essential Component | Existential Explanation |
|---|---|
| **Meaning** | Feedback as a sign of value or worthlessness |
| **Emotion** | Feedback as a lasting emotional experience |
| **Relationship** | Feedback as a reflection of power dynamics |
| **Memory** | Feedback as a durable learning memory |

The nature of the feedback experience, from the perspective of pre-service teachers, is shaped by the simultaneous connection of meaning, emotion, and relationship. Feedback leads to lasting learning and memory when the student feels seen, understood, and respected in. In sum, Van Manne's analysis of the interviews shows that educational feedback in teacher education is not a mere technical or evaluative act, but rather an existential-learning-centered event that can shape or distort pre-service teachers' learning paths, motivation, and professional identities.

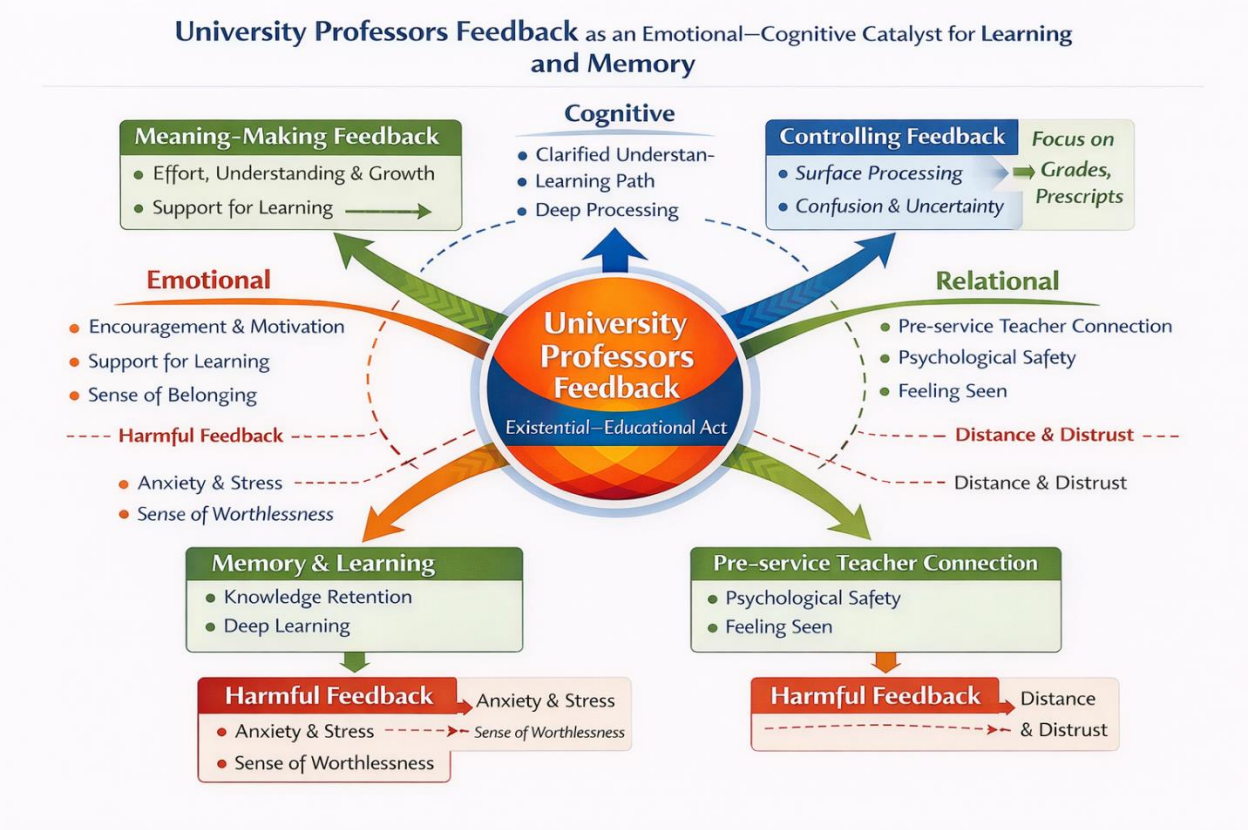


**Figure 1. Conceptual model**

The conceptual model presents university professors feedback not simply as a tool for assessing or correcting performance, but as an 'existential-educational event' that shapes student-teacher learning and memory through a complex interaction between emotional, cognitive, and relational components. As can be seen in Figure 1, feedback can operate in the form of four semantic structures: meaning-making, controlling, damaging, and relational feedback.

By highlighting effort, understanding, and the path of growth, meaningful feedback activates emotional (motivation, encouragement, and belonging) and cognitive (learning path and deep processing) components, providing the basis for sustainable consolidation of learning and promotion of motivation. In contrast, controlling and damaging feedback causes superficial processing, blocking motivation, and disruption of educational memory, by limiting understanding, creating confusion, or reinforcing negative emotions such as anxiety and feelings of worthlessness. Relationship-oriented feedback also promotes active student-teacher participation and acceptance of feedback by strengthening the sense of being seen and psychological security, and indirectly affects the consolidation of learning and the formation of professional identity.

At the cognitive-memory level, positive feedback experiences, especially those that are simultaneously meaningful and relational, activate deep processing and long-term consolidation of

material in memory. On the other hand, negative or damaging feedback, by inducing negative emotions, not only disrupts learning but may also actively suppress educational memory.

This model shows that university professors feedback, as an emotional-cognitive catalyst, transforms the learning process from a linear and purely informational state to a multidimensional and existential process. The simultaneous presence of emotion, cognition, and relationship provides the basis for deep learning, memory consolidation, and the formation of pre-service teachers' professional identities. Therefore, designing and providing feedback in teacher education programs requires attention to content, presentation method, and the quality of human interaction so that feedback can effectively influence learning and memory and play a mediating role in linking emotion, cognition, and pre-service teachers' professionalization.

## Discussion

The findings of the present study show that educational feedback, beyond a mere evaluation process, is an existential-educational event that simultaneously activates the emotional, cognitive, and relational components of pre-service teachers and plays an effective role in their learning and memory. These results are consistent with the view of Van Manen (2016), who considers learning not as a transfer of information, but as a lived and meaning-making experience. Meaning-making and relationship-oriented feedback, by creating intrinsic motivation, a sense of belonging, and deep cognitive processing, provides optimal conditions for the consolidation of learning and long-term memorization (Lang et al., 2022; Mageed, 2025). These findings are also consistent with the research of Al-Obaydi et al. (2023), who have shown that structured and interactive feedback is significantly related to the cognitive, behavioral, and emotional engagement of learners.

In contrast, controlling and damaging feedback, by reinforcing negative emotions, creating confusion and reducing the sense of competence, leads to superficial processing, blocking motivation and even suppressing educational memory, which is consistent with the findings of He and Joy (2026) on the effects of emotional frustration on motivation and academic performance. These results emphasize that the quality of human interaction and the way feedback is provided directly affects the lived experience of pre-service teachers and that "how to say" feedback is as important as "what to say" (Solemannejad, 2025).

Another notable finding of this study is the role of feedback in shaping pre-service teachers' professional identities. Positive, relationship-oriented experiences, in addition to consolidating learning, strengthen pre-service teachers' self-image as teachers, while negative or controlling feedback can lead to a weakening of professional image and reduced motivation. These findings are consistent with those of Hamid (2025) and Mageed (2025), who have shown that emotional intelligence and the quality of teachers' educational relationships can enhance students'

engagement, motivation, and academic performance, and that without emotional components, even advanced cognitive strategies have limited effectiveness.

From an educational neuroscience perspective, findings suggest that meaningful emotional experiences play a crucial role in the consolidation of learning through the activation of attention and memory networks (Rahimi et al., 2025). Thus, university professors feedback is not only an educational stimulus but also an emotional event that can create a lasting imprint in the learner's memory. These findings also address a gap in the research literature, as quantitative and technologically innovative studies, although they have explained macro-relationships between variables, have not paid attention to the lived experience of pre-service teachers and the emotional-cognitive meanings of feedback (Eghbali et al., 2025; Nadav et al., 2026). In online learning environments, designing effective feedback and pre-service teacher interaction significantly contributes to the cognitive and emotional engagement of pre-service teachers, and mastering digital tools and interactive methods can turn receiving feedback into a meaningful experience (Shahverdi et al., 2023). Finally, the findings of the present study show that university professors' feedback, as an emotional-cognitive catalyst, transforms learning from a linear and purely cognitive state into a multidimensional and existential process in which emotion, cognition, and relationship are simultaneously active, providing the basis for deep learning, memory consolidation, and the formation of professional identity.

## Conclusion

Beyond confirming the emotional and cognitive dimensions of feedback reported in previous studies, this research contributes a phenomenological conceptualization of feedback as an emotional–cognitive catalyst. By foregrounding pre-service teachers' lived experiences, the study demonstrates how feedback actively shapes memory consolidation and professional identity formation, rather than merely influencing short-term academic performance. This perspective extends existing feedback models by positioning emotion, relationship, and meaning-making as central mechanisms in learning:

- Meaningful and relational feedback, by simultaneously activating emotional, cognitive, and relational components, facilitates deep learning, memory consolidation, and strengthening of pre-service teachers' professional identity.
- Controlling and damaging feedback, by creating confusion and inducing negative emotions, leads to superficial processing, motivation blockage, and disruption of educational memory.
- Providing effective feedback requires simultaneous attention to educational content, style of expression, and quality of human interaction in order to play a mediating role in linking emotion, cognition, and professionalization of pre-service teachers.

This study focused only on the experiences of pre-service teachers at Farhangian University in the field of elementary education, thus, generalization of the findings to other fields and universities requires additional studies. Data were collected through semi-structured interviews, which may have been influenced by the participants' memory and personal perceptions. Given the qualitative approach and sample limitations, causal relationships between feedback, emotion, learning, and memory cannot be proven, and only lived experience and the meanings embedded in it have been explored.

**Suggestions for Further Research**

- Conduct longitudinal and interdisciplinary studies to examine the long-term effects of meaningful feedback on pre-service teachers' memory and professional identity.
- Combine qualitative and quantitative methods to model the effects of feedback on motivation, learning, and academic performance.
- Examine the impact of feedback in digital and innovative learning environments such as flipped learning and gamification.
- Training teachers to design and provide meaningful and relational feedback considering the emotional and cognitive dimensions of pre-service teachers.
- Creating safe and supportive learning environments that facilitate pre-service teachers' acceptance of feedback and active participation.
- Designing organizational frameworks and educational policies that consider feedback as a tool for professional empowerment and promoting pre-service teachers' motivation.
- This study shows that University Professors feedback, beyond a traditional educational tool, is a fundamental factor in shaping the learning experience, memory, and professional identity of future teachers, and with its conscious and relational design, deep and sustainable learning can be achieved.

## Author Contributions

**Sedigheh Heydari:** Conceptualization, methodology, formal analysis, funding acquisition, resources, data curation; writing original draft, software analysis, visualization.

**Reza Ali Tarkhan:** validation, supervision, investigation, review and editing, project administration.

Both authors have read and agreed to the published version of the manuscript.

## Data Availability Statement

The data that support the findings of this study are based on confidential interviews with pre-service teachers and are therefore not publicly available. Access to anonymized data may be granted by the corresponding author upon reasonable request.

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## Ethical considerations

The authors avoided from data fabrication and falsification.

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## Conflicts of interest

The authors declare no conflicts of interest.

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