FACIAL EMOTION RECOGNITION TECHNOLOGY FOR TEACHER TRAINING: A SCOPING REVIEW

TECNOLOGIE PER IL RICONOSCIMENTO FACCIALE DELLE EMOZIONI NELLA FORMAZIONE DEGLI INSEGNANTI: UNA SCOPING REVIEW

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ABSTRACT
Teacher training often neglects emotional intelligence. Facial Emotion Recognition (FER) tech shows promise in helping teachers recognize their own emotions in real-time. This can improve stress management and teaching effectiveness. A scoping review found limited research but positive signs for FER in teacher training. The review proposes a framework for integrating FER, including ongoing support for teachers. FER could transform teacher training by equipping them to manage their emotions. More research is needed to confirm long-term benefits.

La formazione degli insegnanti spesso trascura l'intelligenza emotiva. La tecnologia di riconoscimento delle emozioni facciali (FER) si mostra promettente nell'aiutare gli insegnanti a riconoscere le proprie emozioni in tempo reale. Questo potrebbe migliorare la gestione dello stress e l'efficacia dell'insegnamento. La seguente scoping review presenta ricerche limitate ma segnali positivi sull'utilizzo della tecnologia FER nella formazione degli insegnanti. La review propone un quadro per l'integrazione della FER, sostenendo la consapevolezza comunicativa degli insegnanti. La tecnologia FER potrebbe trasformare la formazione degli insegnanti fornendo loro gli strumenti utili per gestire le proprie emozioni. Sono necessarie ulteriori ricerche per confermare i benefici a lungo termine.

KEYWORDS
Facial Emotion Recognition; Teacher Training; Teacher Emotion Perception; Nonverbal Communication; Affective Computing; Educational Technology
FER; Formazione insegnanti; Percezione Emozioni; Comunicazione non verbale; Informatica affettiva; Tecnologia educativa

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Introduction

Teaching is an emotional job like other caring professions. These emotions tend to emerge when teachers transact with students and have garnered the attention of a growing number of researchers (Shuts et all, 2014). In 2014, S. Prosen analyzed the most frequently expressed emotions in terms of teacher's verbal expression and students' reaction to happiness, anger, sorrow, and joy. They found that happy expressions have a better performance effect than angry expressions in teacher-student interaction. Emotions are mainly communicated through facial expressions and monitoring and having a feedback about them could improve teaching abilities.

1. Method

To conduct this scoping review, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method to ensure a systematic and transparent approach. The review aimed to identify studies that explored the application of Facial Expression Recognition (FER) technology specifically in the context of teacher training. We developed pre-defined inclusion and exclusion criteria to guide the selection process:

(1) Papers must contain FER technology applied to teachers.

(2) Papers solely focused on FER technology applied to students were excluded.

(3) Papers involving applications to both students and teachers were included.

(4) Non-open access papers were excluded to ensure accessibility.

(5) Non-English papers were excluded to maintain consistency and ease of review.

We conducted searches using two major academic databases, Scopus and Google Scholar, employing the following research string:

"{Facial expressions recognition} OR {FER} AND teacher".

This string was crafted to capture relevant literature about FER technology in the context of teacher training. The research took place from 01 February to 01 March 2024.

2. Results

After screening 1648 abstracts, 6 papers were identified as eligible for further review based on the pre-defined inclusion and exclusion criteria. These papers were selected due to their relevance to the research topic, methodological rigor, and overall quality. Papers that were deemed irrelevant to the research topic, lacked a clear methodology, or were of poor quality were excluded from further consideration. The 6 papers that were selected for further review will be carefully analyzed in detail to extract relevant data and synthesize findings. These findings will be used to support the research question and draw meaningful conclusions.

A 2019 review narrowed the scope of the research to studies published in 2020 or later.

	Method	S-T or T	Y
[1] Zhong et all	YOLOv5+CBSA+CSPA,	Teacher	2023
[2] Dai et all	OpenFace+FER2013	Teacher	2023
[3] Xu et all	Faster R-CNN+ FPN+ CBAM	S-T	2023
[4] Tian et all	GoogleNet-InceptionV3	Teacher	2022
[5] Bhatti et all	RELM + FER2013 + JAFFE	Teacher	2021
[6] Zheng et all	EIDB-13+InceptionResNetV2+CBAM	Teacher	2020
[7] Utami et all	Review	Teacher	2019

3. Discussion

Effective communication is the lifeblood of successful teaching, enabling instructors to impart knowledge, engage students, and cultivate positive relationships with their learners. However, refining communication skills can be a complex endeavor, often requiring self-reflection and feedback from others. Facial expression recognition (FER) technology presents a promising tool to address this challenge by providing real-time, objective feedback on teachers' communication effectiveness, with a particular focus on analyzing the expressions of the teachers themselves.

Teachers' facial expressions play a pivotal role in conveying emotions, establishing rapport, and creating a supportive learning environment.

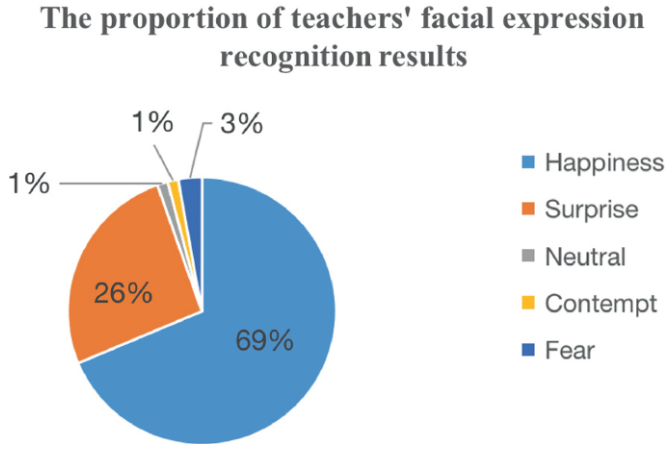

Figure 1. Tian et all. 2022

By analyzing these expressions, FER systems can provide valuable insights into teachers' communication styles and their impact on students. For instance, a teacher displaying a warm and approachable smile can foster a sense of connection and engagement among students. Conversely, expressions of frustration or disinterest may signal to students that the teacher is disengaged or ineffective. FER can also help teachers identify instances where their facial expressions may inadvertently contradict their verbal communication. For example, a teacher expressing boredom while conveying an exciting concept may confuse or disengage students.

Conclusions

Facial expression recognition technology holds immense promise for enhancing teacher communication skills and, consequently, student learning outcomes. By analyzing teachers' facial expressions, FER can provide valuable feedback that helps teachers refine their communication style, enhance their emotional intelligence, and foster more effective learning environments. As FER technology continues to develop and gain wider acceptance, it is likely to play an increasingly important role in teacher training and professional development. In pre-service paths, for example, could have a significant impact.

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