

Teachers' Perceptions of Innovative Tools for the Direct Assessment of Emotional and Social Competencies: Challenges and Opportunities

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ABSTRACT

The assessment of emotional and social competencies remains a major challenge in contemporary education due to their multidimensional and context-dependent nature. While innovative technologies have been proposed as alternatives to traditional self-report methods, their integration into higher education practices remains limited. In particular, recent work by the OECD highlights three main categories of innovative tools for the direct assessment of these competencies: biophysiological measures, virtual and augmented reality, and artificial intelligence combined with digital trace analysis. However, the adoption of such approaches in educational contexts remains underexplored.

This study examines higher education teachers' perceptions of the challenges and opportunities associated with integrating these technologies for the direct assessment of emotional and social competencies within current training programmes. A qualitative approach was adopted, involving forty-six teacher educators in educational sciences selected through convenience sampling. Data were collected through an online open-ended questionnaire and analysed using content and thematic analysis.

The findings reveal a gap between the recognised importance of emotional and social competencies and their practical implementation, alongside limitations of existing assessment methods and difficulties in capturing authentic behaviours. Ethical concerns, limited resources, and insufficient institutional support were also identified as key barriers. At the same time, participants highlighted the potential of innovative technologies to support more objective, continuous, and context-sensitive assessment practices.

These results emphasise the need for integrated, technology-enhanced approaches supported by clear frameworks, professional development, and institutional commitment.

Keywords: Emotional and social competencies; direct assessment; innovative technologies; biophysiological measures; virtual and augmented reality; artificial intelligence; digital trace analysis.

Introduction

Over the past decade, social and emotional competencies (SECs) have become a central focus of contemporary educational policies, complementing traditional emphases on academic achievement (Abrahams et al., 2019). This shift is largely driven by international initiatives such as the Programme for International Student Assessment (PISA), developed by the OECD (2023), and the frameworks proposed by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2020). These initiatives have contributed to embedding social and emotional competencies within the curricula of many education systems worldwide (Chernyshenko et al., 2018; OECD, 2021). Recent research further highlights their critical role in fostering academic success, psychological well-being, and long-term employability (Schoon, 2021; OECD, 2023).

Despite this growing recognition, the assessment of social and emotional competencies (SECs) remains a major scientific and methodological challenge. Existing approaches continue to rely predominantly on self-report instruments, particularly Likert-scale questionnaires, occasionally supplemented by teacher or parent evaluations (Kankaras et al., 2019; Soto et al., 2022). However, a substantial body of recent research has highlighted the limitations of these methods, including susceptibility to social desirability bias, cross-cultural variability, and limited predictive validity in diverse educational contexts (Duckworth & Yeager, 2015; West et al., 2020; Credé et al., 2023). These concerns call into question the reliability and comparability of self-reported measures of SECs, particularly in large-scale or high-stakes assessments.

In response, contemporary research is increasingly oriented towards the development of direct and more objective approaches to assessing social and emotional competencies (SECs). A recent review conducted within the framework of the OECD by Linzarini et al. (2024) highlights the transformative potential of emerging technologies in this domain. These include biophysiological measures (e.g., eye-tracking and heart rate variability), immersive environments based on virtual and augmented reality (VR/AR), and artificial intelligence systems capable of analysing learners' behavioural and digital trace data (Aldrup et al., 2023; Baker & Hawn, 2022). Such approaches enable more situated, dynamic, and potentially less biased forms of assessment, moving beyond static self-report formats.

Nevertheless, these innovative tools also introduce significant challenges. Recent studies have raised concerns regarding the validity of the constructs being measured, the interpretability of outputs generated by artificial intelligence, and the presence of algorithmic biases, alongside broader ethical considerations (Berg et al., 2021; Holmes et al., 2022; OECD, 2021). Furthermore, some so-called objective measures remain difficult to distinguish from cognitive abilities or show weak convergence with traditional assessment approaches, complicating their implementation and interpretation in educational settings (Soto et al., 2022; Credé et al., 2023).

Moreover, a review of recent literature indicates that research has primarily focused on the technological development and psychometric validation of these tools. For example, studies have examined AI-based detection of learners' affective states (Baker & Hawn, 2022), the use of immersive virtual environments to assess socio-emotional responses (Aldrup et al., 2023), and the validation of digital performance-based assessment frameworks (OECD, 2021; Berg et al., 2021). While these contributions have significantly advanced the field, the ways in which these tools are perceived, interpreted, and adopted by teachers remain insufficiently explored. Yet, teachers play a pivotal role in selecting, integrating, and operationalising such tools within real educational contexts.

Against this backdrop, the present study aims to examine teachers' perceptions of innovative tools designed for the direct assessment of social and emotional competencies, with a particular focus on the challenges associated with their integration and the opportunities they offer in educational practice. It further seeks to analyse the factors influencing their acceptability, perceived relevance, and conditions of use, in order to support a more informed and context-sensitive selection of appropriate assessment solutions.

1 Emotional and social competencies

Emotional and social competencies (ESCs) are conceptualised in this study as a set of developable capacities that enable individuals to understand and regulate their emotions, interact effectively with others, and make responsible decisions across diverse contexts. In educational research, these competencies are increasingly viewed as essential for both academic success and overall well-being. In this regard, the framework developed by the Collaborative for Academic, Social, and Emotional Learning (2020) is adopted as the primary theoretical reference, due to its strong empirical grounding and its wide applicability in educational settings (Penton Herrera, 2024). It organises ESCs into five core domains—self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—thus providing a comprehensive structure that integrates both intrapersonal and interpersonal dimensions.

Table 1. Social and Emotional Competencies according to CASEL (CASEL, 2012, p. 9). Adapted from St-Louis (2020, p. 4).

Competencies	Simplified Description	Key Examples
Self-awareness	Recognising one's emotions, thoughts, strengths, and limitations, and understanding their influence on behaviour.	Self-esteem, self-efficacy
Self-management	Regulating emotions and behaviours, managing stress, and working towards goals.	Self-discipline, motivation, organisation
Social awareness	Understanding others, showing empathy, and respecting diversity.	Empathy, respect
Relationship skills	Establishing and maintaining positive relationships and communicating effectively.	Communication, cooperation
Responsible decision-making	Making ethical choices by evaluating the consequences of one's actions.	Problem-solving, responsibility

However, ESCs are conceptualised differently across theoretical traditions, which highlights the complexity of the construct. For instance, the OECD framework (OECD, 2021) situates social and emotional skills within a broader taxonomy influenced by personality psychology, grouping them into domains such as task performance, emotional regulation, and collaboration. This approach is particularly relevant for large-scale and cross-cultural assessments. Similarly, the Big Five personality model conceptualises related constructs as relatively stable personality traits, such as conscientiousness and agreeableness. While these models contribute valuable perspectives, they tend to blur the distinction between stable dispositions and context-dependent, developable competencies (Soto et al., 2022; Credé et al., 2023).

Therefore, the CASEL framework offers a more pedagogically oriented and operational structure, making it particularly suitable for educational assessment contexts. Nevertheless,

important challenges remain regarding the valid measurement of ESCs. In particular, difficulties persist in distinguishing these competencies from cognitive abilities and in ensuring their reliable and objective assessment. These limitations have led to increasing interest in alternative and innovative assessment approaches, especially those aiming to capture ESCs through observable behaviours and real-time interactions (Berg et al., 2021; Duckworth & Yeager, 2015).

2 Challenges in the Assessment of Emotional and Social Competencies

The assessment of emotional and social competencies (ESCs) remains a complex issue due to their multidimensional, dynamic, and context-dependent nature. To date, no single assessment tool has achieved universal consensus, highlighting the need for more rigorous and context-sensitive approaches (Ananiadou & Claro, 2009; Bialik et al., 2016; Maoulida et al., 2022).

Current research relies predominantly on self-report instruments, such as the Social and Emotional Competence Questionnaire (SEC-Q), based on the framework of the Collaborative for Academic, Social, and Emotional Learning (2020) and validated by Zych et al. (2018), which assesses key dimensions including self-awareness, self-management, social awareness, and responsible decision-making. In digital contexts, tools such as the e-COM questionnaire (González-Gómez et al., 2022) extend this approach to online environments by targeting emotional awareness, regulation, impulse control, and social competence.

Despite their practicality and scalability, these instruments present significant methodological limitations. Self-report measures are particularly sensitive to biases such as social desirability, recall bias, and response styles, which may compromise the validity and comparability of results, especially in large-scale assessments (Duckworth & Yeager, 2015; Wigelsworth et al., 2021; Kankaras et al., 2019).

Consequently, increasing attention is being directed towards alternative and more objective approaches to emotional and social competencies assessment. However, many of these approaches remain limited, as they often rely on indirect forms of self-report, overlap with cognitive constructs, or show weak convergence with external measures (Berg et al., 2021; Humburg & van der Velden, 2015). As a result, questions persist regarding their construct validity and their ability to accurately capture the development of ESCs, underscoring the need for more robust and innovative assessment methods.

3 Innovative Tools for the Direct Assessment of Emotional and Social Competencies

In response to the limitations of traditional self-report approaches, recent research has increasingly focused on technology-enhanced methods to enable more direct and objective assessment of emotional and social competencies (ESCs) (Berg et al., 2021; Linzarini et al., 2024). These approaches aim to capture behavioural, physiological, and interactional data in real time, thereby reducing subjectivity and enhancing ecological validity (OECD, 2021; Holmes et al., 2022). Within this perspective, three main categories of tools have emerged in the literature: biophysiological measures, immersive technologies (VR/AR), and artificial intelligence (AI)-based systems (Chiu et al., 2023; Cope et al., 2021).

A comparative synthesis of these approaches, proposed by Linzarini et al. (2024) in a report published by the OECD, highlights their complementary strengths and inherent challenges, as summarised below.

Table 2. Strengths and Challenges of Innovative Tools for ESC Assessment (adapted from Linzarini et al., 2024)

Technology	Strengths	Challenges
Biophysiological measures	Provide spontaneous data less affected by conscious bias; capture internal states; can be integrated into tasks (Ketonen et al., 2023; Richardson et al., 2020)	Non-linear relationship with emotions; sensitivity to external factors (e.g., stress, fatigue); require specialised equipment and expertise (Berg et al., 2021; Linzarini et al., 2024)
Virtual & Augmented Reality (VR/AR)	High immersion; realistic social contexts; increased engagement; improved ecological validity (Giglioli et al., 2017; OECD, 2021)	Limited use in assessment; insufficient evidence of construct validity; high implementation costs (Linzarini et al., 2024)
AI & Digital Trace Analysis	Adaptive and scalable assessments; efficient processing of multimodal data; identification of behavioural patterns (Chiu et al., 2023; Cope et al., 2021)	Limited validation; algorithmic bias; ethical and data governance issues; dependence on proprietary systems (Holmes et al., 2022; Baker & Hawn, 2022)

Overall, while these technologies open promising avenues for advancing the direct assessment of emotional and social competencies, they also raise important methodological and practical considerations that warrant further investigation in educational contexts.

3. Methodology

3.1 Research Design

This study adopted an exploratory qualitative research design to examine the challenges and opportunities perceived by teacher educators regarding the integration of technologies for the direct assessment of emotional and social competencies (ESCs) within contemporary higher education programmes. This approach was selected to enable an in-depth understanding of participants' perspectives and to identify context-specific factors influencing the effective implementation of such technologies.

To achieve this aim, qualitative data were collected through open-ended questionnaires and focus group discussions. These methods facilitated a rich and nuanced exploration of participants' experiences and perceptions, while allowing flexibility for the emergence of unanticipated themes. The study was guided by the following research question:

What challenges and opportunities do higher education teachers perceive in integrating technologies for the direct assessment of emotional and social competencies within current training programmes?

3.2 Participants and Context

The study involved a sample of 46 teacher educators in educational sciences working across various higher education institutions in Morocco. Participants were selected based on their experience in teaching and research in education, as well as their familiarity with emotional and social competencies.

Table 3. Demographic Characteristics of Participants (N = 46)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	24	52.2%
	Female	22	47.8%
Professional Experience	Less than 5 years	12	26.1%
	5–10 years	18	39.1%
	More than 10 years	16	34.8%
Institution Type	University	28	60.9%
	Teacher training centre	18	39.1%
Field of Expertise	Educational sciences	46	100%
Familiarity with emotional and social competencies	Basic knowledge	10	21.7%
	Moderate knowledge	20	43.5%
	Advanced knowledge	16	34.8%

A convenience sampling strategy was employed due to practical and logistical considerations (Ary et al., 2010). Data saturation was reached with 46 participants, suggesting that additional data collection would not yield substantially new insights.

Ethical principles were strictly observed, including informed consent and confidentiality. The sample included both male and female participants with diverse levels of professional experience, ranging from less than five years to more than five years. Participants were affiliated with different institutional contexts, including universities and teacher training centres.

3.3 Instruments

An open-ended questionnaire was designed to explore participants' perceptions of the challenges associated with integrating technologies for emotional and social competencies assessment. This format ensured consistency across responses while allowing participants to express their views freely. The questionnaire was administered online and comprised three main sections: (1) demographic information, (2) awareness and understanding of ESC concepts and assessment practices, and (3) core questions addressing perceived challenges and difficulties related to the integration of emerging technologies for ESC assessment.

The questionnaire items were reviewed and validated by three specialists in education, ensuring clarity, relevance, and alignment with the research objectives.

3.4 Data Analysis

This study employed content and thematic analysis to examine the qualitative data collected from the open-ended questionnaire. Content analysis was used to identify the frequency and occurrence of key words, concepts, and categories within participants' responses, while thematic analysis enabled the identification and interpretation of broader patterns and themes (Braun & Clarke, 2006).

An inductive approach was adopted, allowing codes and categories to emerge directly from the data without reliance on a predetermined theoretical framework. The dataset was analysed through iterative reading, during which initial codes were generated and progressively organised into categories. This process facilitated the identification of overarching themes aligned with the research question (Berg, 2001).

To ensure the trustworthiness of the findings, the study followed the criteria proposed by Lincoln and Guba (1985). Member checking was conducted to enhance credibility. In addition, an experienced researcher independently coded 35% of the data to assess reliability. Inter-coder agreement, calculated using Cohen's Kappa coefficient, reached a high level ($\kappa = 0.95$), indicating strong consistency in the coding process. An independent expert also reviewed the analysis procedures to support confirmability.

Finally, detailed descriptions of the research design and analytical procedures were provided to enhance the transparency and transferability of the findings.

4. Findings

The analysis of participants' responses revealed six overarching themes reflecting teacher educators' perceptions of the challenges and opportunities associated with integrating innovative technologies for the direct assessment of emotional and social competencies (ESCs). These themes illustrate the interplay between pedagogical awareness, methodological limitations, and the potential of emerging technologies.

4.1 Discrepancy between perceived importance and implementation

Participants consistently recognised the importance of ESCs for learners' development; however, their integration into teaching and assessment practices remains limited. A clear gap was identified between teachers' beliefs and their actual practices, largely due to the absence of structured frameworks and operational guidelines.

As one participant noted, *"We all recognise the importance of emotional and social competencies, but we lack concrete ways to assess them effectively."* Another participant highlighted that *"there is a clear difference between what teachers value and what they are able to implement in practice."* These findings suggest that awareness alone is insufficient without institutional and methodological support.

4.2 Limitations of existing assessment practices

Participants emphasised the inadequacy of traditional assessment methods, particularly self-report instruments, which were perceived as subjective and limited in capturing authentic behaviours. Concerns were raised regarding their reliability and vulnerability to socially desirable responses.

For example, one participant stated that *"self-reported responses do not always reflect the real emotional or social state of learners."* Another added that such methods *"do not allow observation of real behaviours, which is essential for evaluating these competencies."* These insights highlight the need for more direct and behaviour-based assessment approaches.

4.3 Challenges in observing authentic behaviours

A recurrent challenge relates to the difficulty of observing and interpreting ESCs in authentic contexts. Participants noted that these competencies are often expressed through subtle, context-dependent behaviours such as gestures, tone of voice, and spontaneous interactions, which are difficult to capture through conventional assessment methods.

One participant explained that *“it is difficult to evaluate emotional or social competencies without observing natural interactions,”* while another stressed that *“these competencies depend on context and are not always directly measurable.”* This underscores the complex and situational nature of ESCs.

4.4 Opportunities offered by innovative technologies

Despite these challenges, participants identified significant opportunities associated with innovative technologies. Such tools were perceived as enabling more objective, continuous, and detailed assessment by capturing behavioural and interactional data.

Participants highlighted that technologies could support more authentic evaluation contexts, with one noting that *“innovative tools can provide more objective data about learners’ emotional states.”* Another emphasised that *“interactive environments allow for more realistic observation of social and emotional skills.”* These findings position technology as a key enabler for advancing assessment practices.

4.5 Ethical and contextual constraints

Participants also raised concerns regarding ethical and practical constraints. Ethical issues included data privacy, consent, and the handling of sensitive emotional information. In parallel, contextual barriers such as limited resources, insufficient institutional support, and lack of technical expertise were frequently mentioned.

One participant noted that *“collecting emotional data raises important ethical concerns,”* while another highlighted that *“implementation is often limited by technical and institutional constraints.”* These factors significantly influence the feasibility of adopting innovative tools.

4.6 Need for integrated and supported approaches

Finally, participants emphasised the importance of adopting integrated approaches that combine technological tools with pedagogical strategies. They advocated for the use of interactive methods, such as simulations and collaborative activities, alongside technological solutions. Additionally, the need for professional development and clear implementation frameworks was strongly highlighted.

As one participant stated, *“combining different approaches provides a more comprehensive understanding,”* while another noted that *“teachers need training and clear guidelines to use these tools effectively.”*

Overall, the findings indicate that the integration of innovative tools for the direct assessment of ESCs is shaped by a balance between significant challenges and emerging opportunities. While participants demonstrate strong awareness and openness towards innovation, their practices are constrained by methodological, ethical, and contextual barriers. At the same time, the perceived potential of technology-enhanced and hybrid approaches suggests promising directions for improving ESC assessment in higher education.

5. Discussion

The present study aimed to explore higher education teachers’ perceptions of the challenges and opportunities associated with integrating innovative technologies for the direct assessment of emotional and social competencies (ESCs). The findings reveal a complex

landscape characterised by tensions between strong pedagogical recognition, methodological limitations, and emerging technological possibilities.

First, the results highlight a persistent discrepancy between teachers' awareness of the importance of emotional and social competencies and their actual implementation in educational practice. This finding is consistent with previous research indicating that, although ESCs are widely acknowledged as essential for learners' development, their integration into curricula and assessment practices remains limited (OECD, 2021; Schoon, 2021). The lack of structured frameworks and clear operational guidelines appears to be a key barrier, reinforcing the idea that policy-level recognition does not automatically translate into classroom practice. This gap underscores the need for more actionable models that support teachers in operationalising ESC assessment.

Second, the study confirms the limitations of traditional assessment approaches, particularly self-report instruments. Participants' concerns regarding subjectivity, social desirability bias, and limited behavioural validity align with existing literature (Duckworth & Yeager, 2015; Credé et al., 2023). These findings support ongoing critiques of self-report measures, especially in high-stakes or comparative contexts, where reliability and validity are critical. The results therefore reinforce the argument for shifting towards more direct and performance-based assessment approaches (Berg et al., 2021).

Third, the difficulty of observing authentic emotional and social behaviours emerged as a central challenge. This reflects the inherently contextual and dynamic nature of ESCs, which are expressed through subtle, situation-dependent interactions. Similar challenges have been documented in prior studies, which emphasise the difficulty of capturing such competencies through standardised instruments (Soto et al., 2022; OECD, 2021). This finding further supports the need for assessment methods that are sensitive to context and capable of capturing real-time behavioural data.

In this regard, the findings highlight the potential of innovative technologies as promising tools for addressing these limitations. Participants perceived technologies such as immersive environments, biophysiological measures, and artificial intelligence as enabling more objective, continuous, and context-rich assessment. These perceptions are consistent with recent work, including the review conducted within the framework of the OECD (Linzarini et al., 2024), which identifies these technologies as key avenues for advancing emotional and social competencies assessment. By capturing behavioural and interactional data, these tools offer opportunities to move beyond static and self-reported measures.

However, the study also highlights significant ethical and contextual constraints associated with these technologies. Concerns related to data privacy, algorithmic transparency, and potential biases echo findings from recent research on artificial intelligence in education (Holmes et al., 2022; Baker & Hawn, 2022). In addition, practical limitations such as lack of resources, insufficient training, and institutional barriers were identified as critical factors affecting implementation. These findings suggest that technological innovation alone is insufficient without appropriate ethical frameworks and institutional support.

Finally, the results emphasise the need for integrated and context-sensitive approaches to emotional and social competencies assessment. Participants advocated for combining technological tools with pedagogical strategies, such as interactive and collaborative activities, as well as for strengthening teacher training and professional development. This aligns with recent recommendations in the literature, which call for hybrid and multi-method approaches to enhance the validity and applicability of emotional and social competencies assessment (Berg et al., 2021; OECD, 2021).

Overall, this study contributes to the growing body of research on ESC assessment by highlighting the central role of teachers' perceptions in shaping the adoption and effective use of innovative tools. It demonstrates that while there is strong openness towards technological innovation, its successful integration depends on addressing methodological, ethical, and contextual challenges. These findings provide important implications for the design of future assessment frameworks that are both technologically advanced and pedagogically grounded.

6. Conclusion

This study sought to explore higher education teachers' perceptions of the challenges and opportunities associated with integrating innovative technologies for the direct assessment of emotional and social competencies within current training programmes. The findings revealed that, although participants strongly recognise the importance of emotional and social competencies for learners' development, their assessment remains largely underdeveloped and insufficiently operationalised in practice.

Participants highlighted several interrelated challenges, including the absence of structured assessment frameworks, the limitations of traditional self-report methods, and the inherent difficulty of capturing authentic emotional and social behaviours. In addition, ethical concerns, such as data privacy and the responsible use of sensitive information, alongside contextual constraints, including limited resources, lack of institutional support, and insufficient technical expertise, were identified as major barriers to the effective integration of innovative assessment tools.

At the same time, the findings revealed significant opportunities associated with the use of emerging technologies. Participants perceived tools such as artificial intelligence, immersive environments, and data-driven approaches as promising avenues for enabling more objective, continuous, and context-sensitive assessment of emotional and social competencies. However, their successful implementation depends on the development of clear guidelines, adequate training, and supportive institutional conditions.

Overall, the study highlights the need for a shift from traditional, subjective assessment practices towards more integrated, technology-enhanced, and pedagogically grounded approaches. Such a shift requires not only technological innovation but also systemic changes in teacher training, policy, and educational practices.

6.1 Implications

From a theoretical perspective, the findings contribute to ongoing discussions on the assessment of emotional and social competencies by emphasising the limitations of self-report approaches and supporting the move towards more direct, behaviour-based, and technology-enhanced methods of assessment (Berg et al., 2021; Organisation for Economic Co-operation and Development, 2021). The study also reinforces the importance of considering emotional and social competencies as context-dependent and dynamic constructs, requiring multidimensional approaches to their assessment.

From a pedagogical perspective, the findings highlight the need to integrate the assessment of emotional and social competencies into teacher education programmes through practical and applied approaches. This includes the development of context-sensitive assessment tools, the incorporation of interactive and simulation-based activities, and the use of digital technologies to support more authentic evaluation practices. Furthermore, teacher education programmes should place greater emphasis on developing teachers' capacities to effectively use these tools.

At the institutional level, the findings suggest the importance of providing adequate infrastructure, technical support, and professional development opportunities to facilitate the adoption of innovative assessment practices. Educational authorities and decision-makers are encouraged to promote frameworks that support the ethical, transparent, and effective use of technology in the assessment of emotional and social competencies, while ensuring alignment with educational priorities and local contexts.

6.2 Limitations

Despite its contributions, this study presents several limitations. First, the use of a convenience sample of forty-six participants may limit the generalisability of the findings. Future research should involve larger and more diverse samples in order to enhance representativeness and allow for broader comparisons.

Second, the study focused exclusively on teachers' perceptions, without including other key stakeholders such as decision-makers, institutional leaders, or learners. Future research should adopt a more comprehensive approach by incorporating multiple perspectives in order to better understand the broader factors influencing the integration of technologies for the assessment of emotional and social competencies.

Finally, the study was conducted within a specific higher education context in Morocco. Further research in different educational and cultural contexts would provide a more comprehensive understanding of the challenges and opportunities associated with the use of innovative assessment tools and would enable meaningful cross-context comparisons.

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