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The digital poster as a multimodal artefact in teacher education: an exploratory study

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Abstract:

This study examines the digital poster as a multimodal artefact commonly used in academic contexts for research dissemination, reinterpreted within an educational and professional framework. Digital posters have been adopted as a form of final documentation for practicum experiences of fifth-year students in the Primary Education degree programme at the University of Xxxx, since the 2022–2023 academic year. The affordances of the poster were analysed to explore its role within the training pathways for students (future teachers) and their mentor teachers. The poster represents both an opportunity to present internship experiences to peers and an authentic task transferable to professional contexts, fostering transversal skills in content selection and visual representation, also through the use of multimedia and AI tools. Data collected via questionnaires administered to 96 student teachers and a convenience sample of tutors (29) focused on the technologies used, metacognitive value, and perceived communicative effectiveness. Findings highlight strengths and weaknesses of digital posters: as tools integrating creativity, digital technologies, and multiple languages, they effectively support embodied reflections; however, they may not fully capture experiential complexity, suggesting the need to integrate them within broader documentation and reflective practices.

Keywords: Digital poster; Teacher education; Digital artefacts; Internship; Metacognitive competence

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1. Introduction

Making one's learning journey visible through the production of an artefact represents a valuable challenge for any learner, as it can both support personal reflection on one's educational path and enable the dissemination and public visibility of that experience. In the case of university students preparing to become teachers, who develop and refine their professional competences through practicum experiences, the final assignment is not merely a concluding report. Rather, it must make visible a process of reflection, the conscious selection of objectives, the design of a sequence of activities and teaching strategies, as well as the documentation of outcomes (Nigris et al., 2019). At the same time, it may offer an authentic

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professional task, requiring future teachers to synthesize, communicate, and document educational experiences through formats that are increasingly relevant in contemporary school practice.

From this perspective, the final assignment may also be interpreted as an embodied artefact, namely a tool that does not merely represent experience but actively participates in the construction and reorganization of thought. The literature on embodied cognition emphasizes that cognitive processes emerge from the dynamic interaction among body, action, and environment, incorporating material objects as constitutive components of cognitive activity. In this sense, artefacts—such as posters—can be considered genuine extensions of the mind through which learners organize, visualize, and communicate their knowledge (Malafouris, 2013). At the same time, they function as devices for "thinking with things", enabling the externalization, manipulation, and restructuring of ideas in visible form (Kirsh, 2013). In educational contexts, such artefacts therefore assume both a semiotic and a social function, mediating the shared construction of meaning through the integration of language, gesture, and visual representation (Radford, 2005; Damiani et al., 2021). Within contemporary embodied perspectives, cognition is not viewed as confined to the individual mind but as distributed across bodies, actions, social interactions, and material artefacts. From this perspective, the educational value of the poster does not reside exclusively in the final product but also in the actions required for its construction, including the selection, spatial organization, visual representation, and manipulation of information. These activities engage learners in an active process of transforming experience into a communicable artefact. From this perspective, the poster may be understood as an external cognitive resource that actively participates in meaning-making processes. Consequently, it can support metacognitive reflection and learning to learn, while contributing to the progressive construction of future teachers' professional identities.

1.1. Learning to learn

Beyond theoretical definitions of the Learning to learn construct, it is essential to identify pedagogical models and educational tools capable of documenting learners' progressive reflection on their own learning processes. Several studies have examined educational practices aimed at fostering the competence of learning to learn (Cardarello & Scipione, 2023; Scipione, 2021, 2022; Stringher, 2021; Caena & Stringher, 2020). These studies have outlined a multifaceted repertoire of tools, including cognitive strategies designed to enhance learning effectiveness, such as the educational use of concept maps to support the elaboration and reinterpretation of experience (Novak, 1990), as well as reflective journals and multimodal assignments developed through the integration of different forms of expression and representation. Recent research has further highlighted the educational value of reflective pedagogies in supporting awareness and professional development. In teacher education, reflective approaches have been shown to positively influence pre-service teachers' learning and academic performance (Habiyaremye et al., 2024), while structured post-task reflection has proved effective in fostering learners' ability to analyse strengths, difficulties, and areas for improvement (Qiu & Xu, 2022). In

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this perspective, artefacts that require learners to reconstruct, organize, and communicate their learning experiences may represent particularly valuable tools for fostering the competence of learning to learn. The reflective potential of these artefacts lies in the need to revisit experience retrospectively, identify meaningful elements, establish connections among events and outcomes, and make explicit the reasoning underlying educational choices. Such processes are closely related to metacognitive awareness and self-regulated learning, both central dimensions of the learning-to-learn competence. Recent evidence syntheses in higher education have similarly highlighted the positive role of reflective, experiential, and active learning approaches in promoting transversal competences and professional development (Michelini & Perla, 2023; Monniello & Traversetti, 2026).

1.2. The Poster as a Multimodal Artefact

The poster is a multimodal artefact that has long been used in academic contexts and represents a valuable tool from several perspectives. According to D'Angelo's (2018) analysis, the academic poster can be understood as a hybrid communicative genre that integrates textual, visual, and oral components in order to convey research content in a concise and effective manner. It combines characteristics of other academic genres while distinguishing itself through the absence of a rigidly codified structure and the need to harmonize different codes and modes of communication within a single, limited space. Unlike reflective journals or portfolios, which often privilege extended narrative accounts, posters require the synthesis and visual organization of experience within a limited space. This characteristic makes them particularly suitable for understanding how learners select, prioritize, and communicate key aspects of their educational experiences.

One of its main features is its ability to condense complex information, transforming the poster into a sort of "illustrated abstract" in which textual content is reduced and supported by visual elements such as graphs, images, and diagrams. In this sense, the poster designer must act not only as a writer but also as an editor and designer, selecting and organizing content in a manner that is clear and immediately accessible. Layout, colours, graphic connections, and spatial organization all contribute to managing the flow of information and enhancing the poster's readability.

Finally, the academic poster is characterized by a strong interactive dimension. Beyond capturing attention through its visual and textual components, it supports discussion with an audience of peers. It is therefore a dynamic communication tool, oriented towards exchange, dialogue, and the development of professional networks.

The multimodality deriving from the use of different modes of expression, a distinctive feature of contemporary communication tools (Kress, 2009), also enables poster designers to produce a synthesis that is sustainable in terms of the amount of writing required while simultaneously fostering creativity. Indeed, it enhances the aesthetic dimension and allows key ideas to be expressed according to the particular sensibilities of the individual who designs it. The integration of verbal, visual, and digital modes of communication may also broaden opportunities for participation,

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allowing students to represent and communicate their experiences through multiple forms of expression rather than relying exclusively on extended written texts.

The use of posters as the final presentation format for projects carried out by students has been specifically explored by Tien (2024), who investigated the distinctive features of both paper-based and digital poster presentations, as well as students' perceptions of these formats.

1.3. Study context

Since the 2022–2023 academic year, students enrolled in the Primary Teacher Education degree programme at the University of Xxxxx have been required to participate in a *practicum project* and produce a digital poster as its final output. Fifth-year *practicum projects* constitute integrated pathways of training and practice involving student teachers and school-based mentors in collaboration with partner schools. In the initial phase, students participate in a theoretical module on specific topics (e.g., reading comprehension, science education, educational technologies, intercultural education) delivered by university lecturers. This is followed by a period of school-based practicum, which may begin in parallel with the initial training phase, during which students systematically observe classroom practices in order to identify classroom dynamics, competence levels, and educational needs. On this basis, they develop, together with their school-based mentor, a project proposal structured as a Learning Unit (Castoldi, 2017), which is subsequently refined under the supervision of a university tutor. Students then implement the planned activities, taking responsibility for classroom management, instructional materials, assessment, and evaluation, with an intermediate review session involving the academic coordinators of the project. The final stage consists of a collective presentation through a digital poster, optionally supplemented by a QR code linking to additional photographic documentation. This exhibition enables the sharing and discussion of multiple project experiences within a dialogic setting with the other students involved in the same practicum project and their school-based mentors. This approach reflects a conception of teacher education as participation in communities of practice (Kennedy, 2005), rather than as a purely seminar-based model.

The present study aims to explore participants' perceptions of the poster as an educational tool and to provide a baseline for future monitoring and progressive refinement of this presentation format over subsequent academic years. The long-term goal is to improve the use of posters as a support for reflection, communication, and professional learning within practicum projects. The following research questions guided the exploration:

1. Is the design of a final summary poster perceived by student teachers as supporting reflection, metacognitive awareness, and learning from practicum experiences? What role does artificial intelligence play in poster preparation?

2- How do student teachers and mentor teachers perceive the value of poster presentations for sharing and discussing practicum experiences?

3- What strengths and limitations do student teachers and mentor teachers identify in the use of posters as educational and reflective tools?

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2. Materials and Methods

The present exploratory study considers two perspectives: those of the student teachers and those of the school-based mentor teachers who attended the presentation of all the practicum experiences and were actively teaching in the preschool and primary classrooms that hosted the students' practicum projects.

Two different digital questionnaires were administered. The first was addressed to all 231 fifth-year students enrolled in the Master's Degree Programme in Primary Teacher Education at the University of Xxxx. The questionnaire comprised eight items, six of which were intentionally designed as fully open-ended questions. Some questions explored participants' perceptions of the poster's usefulness as a tool for reflecting on project design, as well as its strengths and limitations. Other questions investigated the software used for poster production and the main purposes for which artificial intelligence (AI) tools may have been employed during the design process.

The second questionnaire was administered to a convenience sample of 39 school-based mentor teachers who agreed to participate. It was distributed at the end of the final meeting of three practicum projects, during which the mentors attended the presentation of the posters prepared by the student teachers. Participants were asked to rate their appreciation of the poster presentations on a five-point Likert-type item. In addition, open-ended questions investigated the perceived usefulness of the sharing session facilitated through the poster presentations, the main strengths and weaknesses of the format, and aspects that might have been of interest to the audience but were not adequately represented within the poster itself.

Data collection took place at the end of the 2025–2026 academic year, after the completion of the practicum projects. Each fifth-year student produced an individual digital poster. Poster presentation sessions were organised at the end of each practicum project and typically involved 15–20 student teachers within a 2.5-hour session. Each participant was allocated approximately eight minutes to present the project and discuss its main outcomes.

Student teachers who completed the questionnaire belonged to all practicum projects offered during the fifth year of the degree programme. Mentor teachers belonged to three practicum projects in which the author was involved as a member of the scientific coordination team.

The questionnaires were specifically developed by the researcher to collect participants' perceptions regarding this relatively novel use of the poster format. Responses were collected anonymously immediately after the presentation sessions.

Participation in the study was voluntary and the first item of each questionnaire asked respondents whether they agreed to participate in the research. The management of photographs involving minors complied with GDPR regulations. For this reason, some participants reported using image-editing tools and AI applications to anonymise images, obscure children's faces, or transform photographs before including them in the posters.

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The findings were analysed primarily through a qualitative approach aimed at examining the content of participants' responses in terms of the ideas and meanings they expressed. Interpretative categories were developed ex post facto on the basis of the themes that emerged from the responses to the open-ended questions (Creswell & Plano Clark, 2018). The coding process was carried out by the author. The unit of analysis was each theme identified within a response rather than the response as a whole. Consequently, a single response could receive multiple codes and categories were not mutually exclusive. Frequencies therefore refer to the occurrence of themes rather than to the number of participants. All responses were considered valid for analysis.

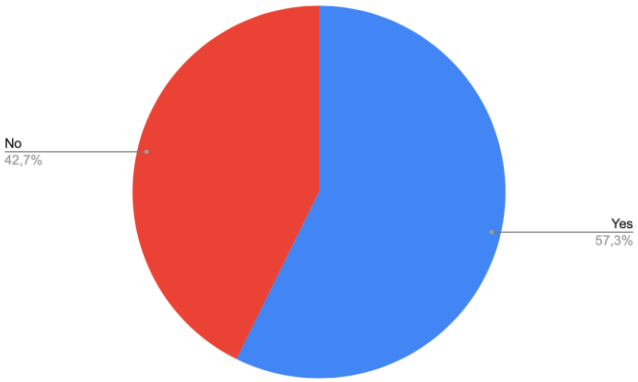
3. Results

3.1. Student Teachers' Questionnaire

Ninety-six students responded to the questionnaire, corresponding to 41.56% of all fifth-year students to whom the survey was addressed. The questionnaire was embedded within the broader end-of-project evaluation survey. Consequently, responses may reflect the perspectives of students who were particularly motivated to provide feedback on the practicum experience. This aspect should be considered when interpreting the findings.

The first question explored participants' perceptions of the usefulness of the poster as a tool for reflection.

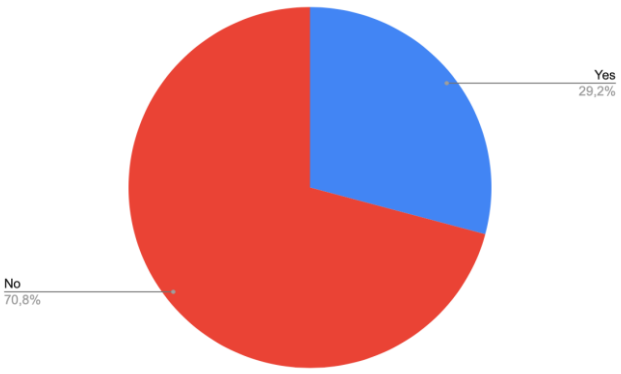
Fig. 1: Responses to the question: "Was the preparation of the poster useful for reflecting on your practicum experience?"



Students were then asked to indicate whether and how Artificial Intelligence (AI) had been used in the preparation of the poster and to specify the main purposes for which it had been employed (see Figure 2 and Table 3).

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Fig. 2: Use of the Artificial Intelligence (AI) for the poster preparation



Twenty-eight student teachers (29.2%) reported using AI during poster preparation. The most frequently reported purposes were image generation, content summarisation and organisation, graphic design support, language revision, QR code generation, and the editing of photographs for privacy-related reasons.

The second question, aimed at eliciting explanations for the affirmative responses, was administered only to students who had answered "yes" to the previous question. The principal themes identified in their responses are summarized below (see Table 1).

Table 1: Themes emerging from responses to the question: "If yes, how did the preparation of the poster support your reflective process?"[1]

EMERGING THEMES	N
Essential aspects of the project/Learning Unit	24
Overall view of the project; revisiting phases and drawing conclusions from the learning journey	14
Reflecting on and revisiting the experience	14
Reflection on outcomes in relation to objectives	7
Communicative organization aimed at providing a clear explanation for an audience unfamiliar with the project	6
Visual representation and organization of ideas	5
Self-assessment	5
Reflection on strengths and challenges	4
Learning from others' poster presentations	2
Concise mode of presentation	1
Awareness of my future role as a teacher	1
Creative form of expression	1

[1] Multiple themes could be assigned to the same response; therefore, frequencies exceed the number of respondents. All responses were considered valid.

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The third question explored participants' perceptions of the strengths and limitations of the poster as a means of presenting their work to fellow student teachers. The main themes identified in the responses are summarized in the following table (see Table 2).

Table 2: Perceived Strengths and Limitations of the Poster as a Tool for Peer Presentation[2]

Strengths	N	Limitations	N
Immediacy, effectiveness, and visual impact	42	Excessive synthesis and reduction of complexity	38
Conciseness	27	Limited space available	9
Facilitates discussion and dialogue	11	Limited representation of the relational dimension	3
Clarity	7	Need to supplement the poster with QR codes	3
Aesthetic quality and creativity	5	Insufficient time for presentation and discussion	3
Use of QR code	3	Performance anxiety	1
Supports an overall view of the experience	3		

3.2. Mentor Teachers' Questionnaire

The following section presents the views of the sample of mentor teachers who participated in the practicum projects and attended the student teachers' presentations during the final meeting of three practicum projects. The first figure provides an overall summary evaluation of the experience, while the subsequent tables and figures, based on requests for more detailed explanations, offer further insights into participants' perceptions and reflections.

[2]Multiple themes could be assigned to the same response; therefore, frequencies exceed the number of respondents. All responses were considered valid.

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Fig. 3. Distribution of ratings (1–5) for the question: "How much did you appreciate the presentation of the different practicum experiences through posters?"

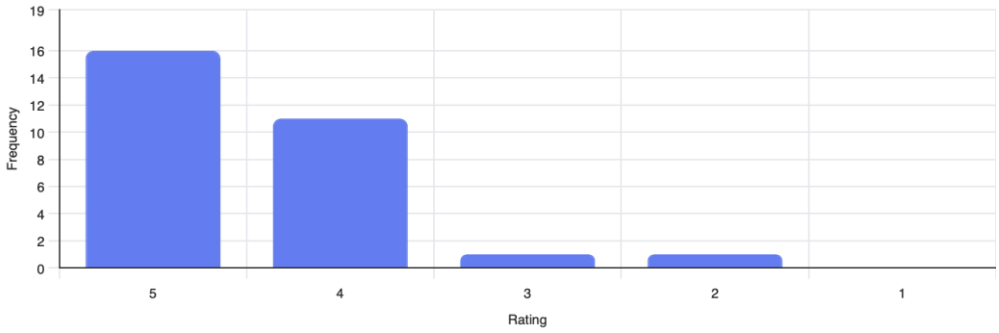


Table 4: Themes emerging from responses to the question: "Did listening to the presentation of the activities through posters help you reflect on teacher education issues? If yes, how did the poster format support this reflection?"

Emerging Themes	**N.**
Conciseness and key takeaways	10
Practical suggestions, insights, and usefulness	9
Support for attention and engagement	9
Immediacy, visual impact, and accessibility	8
Clarity	7
Overall view of the experience	2
Potential use for sharing outcomes with parents	1
Limitation: Time constraints	2
Limitation: A single-perspective view	1

The following tables summarize the strengths and limitations of sharing experiences through poster presentations, as well as educational aspects that participants would have liked to explore further but that were not sufficiently evident in the posters.

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Table 5: Strengths and Limitations of Poster Use According to School-based Mentor Teachers

Strengths	N.	Limitations	N
Immediacy/accessibility/simplicity	11	No limitations identified	5
Conciseness	7	Need for more in-depth explanation	1
Clarity	8	Too many posters presented in too little time	1
Effectiveness	2	Lack of clarity	1
Connection to everyday teaching practice	1	Incomplete information	1
Richness of information	5	Shifts attention away from key aspects	1
Support for attention and engagement	4	Excessive textual content	1
Stimulus for personal reflection	2	Oversimplification of complexity	1
Engagement, participation, and empathy	3	Limited of available space	1
Sustainability of the task	1		

Table 6: Themes emerging from responses to the question: "Were there aspects of the student teachers' training or project design that you would have liked to explore further but that were not sufficiently represented in the poster?"

Emerging Themes	N.
No additional aspects identified	21
References and bibliography	3
More time to explore the materials accessible through QR codes	2
Logistical and organizational aspects	1
Children's responses to the activities proposed by the student teachers	1
Challenges encountered during project implementation	1

4. Discussion

The analysis of the students' questionnaire responses provided a nuanced answer to the first research question, revealing that a majority of respondents perceived the poster positively. Mentor teachers highlighted several of the same strengths identified by student teachers, particularly conciseness, clarity, visual

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immediacy, and the possibility of sharing educational experiences with colleagues. In particular, the poster was valued for its conciseness and visual immediacy. Most students reported that preparing the poster supported reflection and enhanced their awareness by providing an overall view of the project that they had designed and implemented. The process of selecting the essential elements of the experience appears to have been especially beneficial. As one student noted, "Reworking the entire practicum project within a limited space and then producing a final visual summary helps and supports reflection on the path undertaken.". Other participants highlighted the communicative value of the format: "The use of the poster as a visual communication tool makes the experience immediate, synthetic, and easy to share with colleagues." At the same time, several respondents pointed out its limitations: "The need for synthesis may simplify the experience too much, leaving out important or more complex aspects." This reflective process was also described in terms of self-assessment and increased awareness of both the strengths and the limitations of one's own professional development.

Contrary to expectations, one of the educational intentions underlying the introduction of the poster did not emerge explicitly from the students' responses, namely the opportunity to engage in an authentic task involving the design of a communication-oriented visual artefact that may be useful in future professional practice, where the documentation of learning processes is receiving increasing attention. Nevertheless, several students emphasized that the design process was oriented towards the audience and required particular attention to visual communication. This aspect should be considered alongside the reported use of AI for summarizing practicum experiences, as declared by a considerable number of students. Indeed, if the construction of the synthesis and the identification of key elements are delegated to AI tools, students may lose some of the cognitive benefits associated with organizing conceptual nodes through retrospective reflection, a process that supports awareness and learning (Novak, 1990; Baron, 2022). AI applications were reported to be used primarily for planning activities, generating images, and addressing issues related to participants' privacy protection. The theme of creativity, which the assignment was expected to foster, emerged less prominently than anticipated, although this interpretation should be considered exploratory and would require further investigation through studies specifically designed to analyse the relationship between AI use, creativity, and reflective processes.

With regard to the second research question, which relates to reflection mediated by an artefact supporting opportunities for professional exchange and shared reflection within a community of practice, the mentor teachers expressed a generally positive evaluation of the experience. They highlighted many of the same strengths identified by the student teachers, although they also indicated that they would have appreciated more time for discussion and in-depth exploration of the experiences presented. Such interaction time, which is closely linked to the affordances of the poster format, would have enabled more contextualized accounts of everyday teaching practices. In practice, however, opportunities for discussion were necessarily limited due to the large number of posters scheduled for presentation. These findings suggest the need to reconsider the organization of poster presentation sessions for mentor teachers.

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Regarding the third research question, a comparison of the perspectives of student teachers and mentor teachers indicates that the perceived strengths of the poster outweigh its limitations. Nevertheless, several participants observed that the very conciseness that characterizes the poster is also perceived as a weakness, as it may oversimplify the complexity of educational experiences and fail to provide adequate space for important dimensions of project implementation, such as relationships and children's engagement. Similarly, the possibility of incorporating additional materials through QR codes was viewed both as an opportunity and as a limitation: while QR codes allow supplementary documentation to be included, the limited time available during the final presentation session often prevents an adequate discussion of such materials.

A further limitation of the present study is that it focused exclusively on participants' perceptions. The quality, readability, multimodality, and reflective value of the posters themselves were not analysed. Consequently, no conclusions can be drawn regarding the actual effectiveness of the posters as educational artefacts. Future investigations should integrate participants' perceptions with evaluations conducted by university tutors and scientific coordinators, as well as with analyses of the posters produced.

Future investigations could include the perspectives of university tutors and the project's scientific coordinators, who might provide further insight into the quality of the posters produced by students and potentially offer examples of effective poster design. It may also be hypothesized that, when responding to open-ended questions, both students and teachers identified only some of the aspects they considered relevant. Consequently, the categories developed ex post from the qualitative analysis could contribute to the refinement of future data collection instruments. Future studies may also usefully distinguish between three related but distinct dimensions: the process of designing the poster, the poster as a final artefact, and the public presentation session. In this initial exploratory phase, participants were invited to reflect freely on all these dimensions, allowing the emergence of themes that may guide more focused investigations in subsequent years. For example, the questionnaires used in the present study could be revised by incorporating response options derived from the themes identified in this analysis, thereby providing a more comprehensive framework for investigating perceptions of poster use and enabling respondents to identify the aspects they consider most relevant.

5. Conclusions

The questionnaires administered to fifth-year student teachers enrolled in the Primary Teacher Education degree programme and to their school-based mentor teachers explored the effectiveness of the poster as a final artefact for supporting reflection on the learning journey and facilitating the sharing of good practices among colleagues.

The findings highlight several strengths associated with both the design and presentation of posters, while also pointing to the need for complementary formats capable of communicating the complexity of practicum experiences and providing additional opportunities for discussion and in-depth exploration. According to the

perceptions expressed by student teachers and mentor teachers, the poster appears to represent a promising format for supporting reflection on practicum experiences, documenting educational projects, and facilitating professional exchange. At the same time, the limitations identified by participants suggest the need to refine both the design of the artefact and the organisation of poster presentation sessions.

The study should be considered an initial exploratory step intended to inform the future redesign of practicum pathways and poster-based documentation practices. Further investigations involving analyses of the posters themselves, together with the perspectives of university tutors and scientific coordinators, will be necessary to better understand the potential contribution of this format to teacher education.

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