Teacher education is a deeply pedagogical process rooted in values, ethics, and the social purpose of schooling. Globally, it sits at the core of educational quality and fairness, as research in comparative and international education demonstrates: the training of teachers directly influences students' learning chances, social inclusion, and the democratic aims of schools. Teachers are not simply transmitters of curricula, but active professionals whose convictions, reflective skills, and ability to manage the complexities of classroom life give shape and substance to the educational experience itself.

The pedagogical dimension of teacher education frames teaching as a relational, context-aware, and ethically grounded profession rather than just a set of procedural skills. From a research perspective, this demands robust research methodologies that can critically examine the complex realities of schools and inform evidence-based policies. Equally important is the connection between theory and practice, which helps to bridge the persistent gap between universities and schools.

The contributions gathered in this volume reflect the richness and diversity of experiences showcased during the ATEE Spring Conference 2024, held at the University of Bergamo from May 29 to June 1, 2024. The volume presents 70 selected papers out of more than 300 presented by researchers representing over 40 countries.

This broad spectrum of studies highlights promising directions that can inspire renewed inquiry and concrete proposals aimed at improving contemporary educational systems.

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May 29th – June 1st, 2024
S. Agostino, Bergamo

Edited by Nicole Bianquin and Francesco Magni

UNIVERSITÀ DEGLI STUDI DI BERGAMO

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ATEE
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BOOK OF PROCEEDINGS

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Reflecting together online and offline: A systematic review on the types of peer reflection activities in teacher education

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Abstract

During an era that highly values the collective construction of meanings and offers multiple online tools to support enriching interactions, socially mediated reflection activities have emerged more consistently in teacher education. This systematic review aims to crystallize the different types of peer reflection activities portrayed in initial teacher education. Examining the social processes (exploration, engagement, co-construction, feedback), the environment (online, offline, blended), and the group size (pairs, small, medium, big) of peer reflection activities presented in 98 relevant research papers, three broader types of activities emerged bearing a unique combination of the three characteristics: outcome-driven, community-driven, and exploration-driven peer reflection activities.

Keywords: reflection; social reflection; information and communication technology; online communication; teacher education.

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1. Introduction

Reflection is considered a critical goal in teacher education agendas, with a growing body of research exploring how to effectively encourage preservice teachers' engagement in reflection activities (Korthagen & Nuijten, 2022). Reflection's conceptualization and enactments interacted with and evolved within various epistemological shifts. One key shift derives from the expansion of digital technologies and the new social practices they bear (Buckingham & Willet, 2006). Teacher educators have embraced the infusion of information and communication technologies, broadening their methods to engage student teachers in reflection activities (Watanabe & Tajeddin, 2022). The new online environments offer enriched personal and social mindtools that not only enhance teachers' reflection but have also led to the reconceptualization of reflection towards a more interactional and extroverted direction.
Nevertheless, the technological medium per se cannot guarantee deep reflection and may evoke practices of immediate rather than thought-provoking use (Bates, Phalen & Moran, 2016). Furthermore, conducted online or offline, group reflection activities sometimes lead to concerning outcomes (Elhussain & Khojah, 2020, Erdemir & Yeşilçınar, 2021) denoting the importance of further research on the nature of socially mediated reflection activities. Considering the diverse frameworks, goals, and methods that guide group reflection activities in teacher education, a first step could be tracing and grouping the different characteristics of socially mediated activities in teacher education, in order to provide an insight into the methodological choices available to teacher educators for designing social reflection paths in different types of learning environments.
To this end, the present study aims to explore the types of reflection activities portrayed in teacher education research, focusing on peer reflection activities. To gain a comprehensive picture of these types, we focused on three characteristics of the activities: the social processes enacted, the environment in which they are conducted (online, offline, blended), and the group size of student teachers involved. Through a systematic review of the relevant literature, we attempt to trace peer reflection activities in initial teacher education and group them according to these three characteristics. The research question that guides the systematic review is:

- What typologies of peer reflection activities are portrayed in initial teacher education research regarding the social processes, the environment, and group size they entail?

2. Methodology

To examine the types of peer reflection activities in teacher education, a systematic review was implemented following the guidelines of the JBI Manual for Evidence Synthesis (Aromataris and Munn, 2020). The following eligibility criteria were defined for a paper to be included in the review:

- Publication type: peer-reviewed, empirical studies in the English language;
- Phenomenon of interest: studies aiming to explore teachers' aspects of reflection;
- Participants: studies involving preservice student teachers participants;
- Context: studies implementing and examining peer reflection activities.

We searched for relevant publications in four bibliographic databases (ERIC, Scopus, Web of Science, and ScienceDirect). The terms used in the search engines were "reflection" (reflect OR reflection OR reflective OR reflectivity OR reflexive OR reflexivity) AND "teacher education". The search was limited to publications after 1983 when D. Schön published the book "The Reflective Practitioner: How Professionals Think in Action" (Schön, 1983), which shifted teacher educators' attention toward developing reflective teachers. The bibliographic search was performed in 2022, resulting in 24.318 academic papers. After removing duplicates across the four databases (9.162 papers removed), a thorough selection process followed. The selection process included title/abstract screening (14.150 papers excluded), full-text eligibility assessment (444 papers excluded), and quality appraisal (454

papers excluded). Ninety-eight (98) papers were deemed eligible for inclusion in the review (see hyperlinks in the Appendix). The majority of the 98 studies employed either qualitative (N=48) or mixed-methods designs (N=47), with only a small number (N=3) using a purely quantitative approach. The average sample size across the studies was 42 participants. The studies were conducted in America (N=33, mostly in the USA, N=30), Asia (N=30, primarily in Turkey, N=9, and China, N=6), Europe (N=28, mainly in the UK, N=7; Ireland, N=4; and Sweden, N=3), and in Australia (N=8). Six of the 98 papers examined two distinct peer reflection activities instead of one, leading to a total of 104 peer reflection activities displayed and studied in the included papers.
Information about the goal and the methods of each peer reflection activity was traced in the Introduction and the Methodology sections of the research papers. The textual data extracted were scrutinized for information concerning three characteristics of the peer reflection activities: the interaction process, the reflection environment, and the group size of the activity.

- Interaction processes. A thematic analysis was conducted to identify the social processes that permeate student interactions (Braun & Clarke, 2019). Following the abductive reasoning tradition, the patterns we initially searched in our data were based on the four principles of social constructivism that Barak (2007) proposed for science teacher education activities: *exploring* new venues, increasing *engagement*, *co-constructing* content, and providing/receiving *feedback*. As the analysis proceeded, data shaped the definitions of the four categories. In some activities, more than one of the four processes was evident. In these cases, the activities were categorized according to the most prevalent social process.
- Environment. The peer reflection activities were assigned to the *online*, *blended,* or *face-to-face* category, depending on the space in which the interaction took place.
- Group size. The peer reflection activities were assigned to the *pairs* (2 students), *small group* (3-6 students), *medium group* (7-30 students), or *large group* (31+ students) category, depending on the number of students who interacted.

Descriptive statistics were used to demonstrate the frequency of each characteristic in the peer reflection activities studied. In addition, a chi-squared test was conducted to explore possible correlations among the three characteristics. Lastly, exploratory Latent Class Analysis (LCA) was performed, which clusters data with similar characteristics. Through Latent Class Analysis, we examined tendencies in the grouping of the three characteristics, illuminating potential typologies of peer reflection activities. Jamovi open statistical software was used to carry out these analyses.

3. Results

3.1 Peer reflection interaction processes

Feedback (33.7%). The thematic analysis demonstrated that the most frequent form of interaction displayed in preservice teacher reflection research is peer feedback (33.7%). The activities in this category were designed to encourage student teachers to critically reflect on their peers' practices or beliefs, to provide constructive feedback, and to receive feedback as well. An indicative example can be traced in the activity portrayed and studied in the paper of Manouchehri (2002):

> «… they were asked to observe one another's teaching. Following each observation period, they provided feedback on each other's practice, and shared ideas for improving their teaching» (Manouchehri, 2002, p. 716).

Social engagement (30.8%). Almost in the same frequency with feedback, were the activities targeting students' cognitive and emotional engagement in reflection through social interaction (30.8%). Here, the sense of belonging to a community and the connection among students were prioritized by the authors of the sample to induce social motives to reflect. For example,

> «The task proposed that students post their work, including ideas, concepts and artifacts, and comment and discuss on peers' work. This requirement was designed so that students could build connections with peers with a view to enhancing collaborative participation in the task over the five weeks» (Park, 2015, p. 11).

Co-construction (20.2%). Co-construction processes were prevalent in 20.2% of the activities studied, where students interact towards a common goal. The co-construction category included activities characterized by the embracement of collaborative approaches and intense negotiation of meanings, in order for students to reach a common conclusion or to shape together a teaching plan. In the following example, students co-authored a paper illustrating the profile of an elementary science teacher:

> «(1) participants shared and collaboratively reflected on their journal entries and individual synthesis papers; (2) participants engaged in collective dialogue and negotiation, in light of the practical merit of reflection and on the structured and focused objective of profiling the portrait of an elementary science teacher; (3) participants used their collaborative reflections resulting from collective dialogue and negotiation to collectively write their synthesis paper on the profile of an elementary science teacher» (Subramaniam, 2013, p. 1860).

Exploration (15.4%). The least common social process to scaffold student teachers' reflection seemed to be the exploration of new venues in interaction with peers. The reflection activities entailed in this category emphasized explorative and individualized approaches. Specifically, students were given control to choose with whom and how intensely they would interact with peers, according to their personal interests and needs, for example:

> «The central task of the successive cycles of the learning activity consisted of students tweeting during a relevant period in the term. They were free to decide the content of their tweets and choose their topics, their hashtags, and the users they wanted to interact with» (Pérez Garcias, et al., 2020, p. 4).

3.2 Peer reflection environment

Regarding the environment where the peer reflection activities took place, both the online and the face-to-face environments were frequently used to host and mediate reflective interactions. Specifically, 50 activities were performed face-to-face, 44 in online environments, whereas only 10 peer reflection activities took place in blended environments. Asynchronous tools were mostly used (91,4%) with forums, discussion boards, and blogs to prevail (72,4%). Activities also incorporated occasionally collaborative video annotation tools, teleconferencing, e-mail, chat, and digital repositories.

3.3 Peer reflection group size

Concerning the group size, slightly less frequent were the groups with up to 30 members (big groups, N=17) and the pairs (N=22), while the most common group size in the activities studied were the medium groups (7-30 members, N=29) and the small groups (3-6 members, N = 26). Less often, activities included interaction in groups with different sizes, combining pairs and small groups (N=5), medium and big groups (N=3), and small and medium groups (N=2).

3.4 Typologies of peer reflection activities in teacher education

To explore whether the three characteristics are combined to form certain typologies of peer reflection activities, we initially sought statistically significant correlations among the three variables. Chi-squared test results indicated statistically very significant correlations between all the pairs of variables (see Table 1), suggesting that all three characteristics of peer reflection activities are connected.

x^2 test		p
interaction processes	group size	< 0.0001
environment	group size	= 0.0013
interaction processes	environment	< 0.0001

Table 1. Correlations between the interaction processes, environment and group size

We then proceeded to examine how the three characteristics might be interrelated, exploring potential groupings through Latent Class Analysis. The optimal number of classes to fit the model was defined as three classes (see Figure 1), that is, three broad types of peer reflection activities emerging through combinations of the three characteristics. The Latent Class Analysis model yielded an Akaike Information Criterion (AIC) of 707, a Bayesian Information Criterion (BIC) of 776, and an entropy value of 0.828, suggesting a reasonably fitting model with strong class separation.

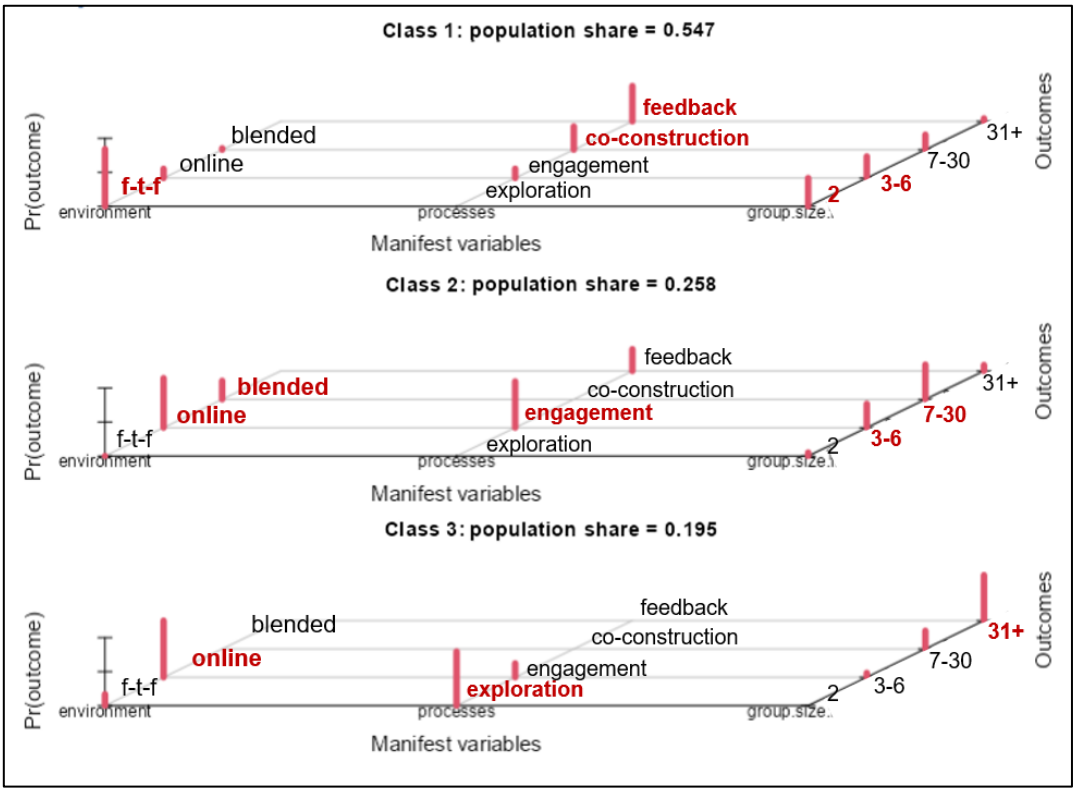

Figure 1. Latent Class Analysis Plot: Typologies of peer reflection activities in initial teacher education (Class 1: outcome-driven activities, Class 2: exploration-driven activities, Class 3: community-driven activities)

The first class, in which most activities tend to gather (54.7%), included face-to-face activities, mostly feedback and co-construction social processes, and groups with fewer members, especially pairs. The activities in this class tend to focus on reflection outcomes, be it the output of reflective feedback, or an artifact collaboratively created. Therefore, they could be characterized as "*outcome-driven activities*". The other two classes, on the contrary, portray more process-oriented activities, performed in bigger groups and often online. Specifically, the second class (25.8%) illustrated mainly activities performed in medium-sized groups and online or blended learning environments, where the "social engagement" process is prevalent denoting a focus on building connection among students to increase engagement in the reflection process (*community-driven activities*). Finally, the third class (19.5%) tended to encompass online peer reflection activities of exploration, performed in big groups (*exploration-driven activities*).

4. Discussion

This systematic review attempted to explore the types of peer reflection activities in initial teacher education. Specifically, we examined how different environments, group sizes, and interaction processes are combined in peer activities designed to encourage student teachers' reflection. Latent Class Analysis indicated three distinct types of activities: outcome-driven, community-driven, and exploration-driven peer reflection activities.

Outcome-driven activities were the most frequently reported category. Conducted in groups with fewer members who interact face-to-face towards a reflective output, they may mirror a more traditional set of reflection activities in teacher education. The reflective feedback permeates these activities, echoing the first types of reflective interactions described in teacher education: those of a mentor teacher and a mentee student teacher where the first provides feedback on the teaching practices of the second (Zeichner & Liston, 2013). Along with feedback, the outcome-driven category also incorporated all the activities with co-construction processes. Constructing meaning in collaboration with "others" is a contemporary teaching methodology that has evolved alongside social technologies, utilizing various online tools to facilitate the process (Scardamalia & Bereiter, 2006). The co-construction activities of our sample though were performed off-line, denoting a gap in making use of the technological affordances provided, especially considering that co-authoring online tools were absent from all the activities studied. Overall, results suggest that authors value face-to-face communication performed in small groups for outcome-driven processes that entail feedback and intense negotiation of meanings.

The promising prospects of technology were mainly used in the other two types of activities that emerged through latent class analysis: community-driven and exploration-driven activities. Community-driven activities prioritized strong connection bonds among peers so as to trigger social motives that will in turn increase cognitive and emotional engagement. In this category, the social engagement process was dominant and most of the blended reflection environments were observed. This combination of characteristics aligns both with higher education's aspiration to foster social motives in learning (Xie, King & Luo, 2023), and with blended learning's goal of extending engagement beyond in-class interactions (Halverson & Graham, 2019). Exploration-driven activities, on the other hand, were defined by the locus of control on student teachers regarding the type of peer interaction that best suited their individualized needs. The opportunity for student teachers to navigate their own reflection path resembles the principles of self-directed learning, in which students choose when and how they will make use of their peer network to scaffold their learning process (Brookfield, 2009). Exploration-driven activities were conducted mostly online in big groups, leveraging the affordances of new technologies for access to a large pool of information and (peer) opinions. Besides, self-directed learning, which we suggest pervades the activities of this class, is closely related to the deployment of information and communication technologies (Seaton, 1993). In both community and exploration activities, authors focused on the process that leads to reflection and took special care to reinforce it through the sense of belonging to an online community and through opportunities to digitally navigate among peers' posted opinions and artifacts.

5. Concluding remarks

In conclusion, the results indicated a balance between outcome-driven and process-driven peer reflection activities. The authors of the sample designed traditional offline environments to mediate the reflective *outcome* of student teachers but also exploited the potential of technology for community connection and self-directed exploration in order to improve the quality of the reflection *process*. The present systematic review provides evidence that teacher education research uses new technologies to host and explore alternative types of peer reflection activities (community-driven and exploration-driven peer activities), suggesting that social technologies enrich teacher educators' available tools toward more process-oriented peer reflection approaches.

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Appendix

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98		