

# Boundary Devices for Reflexive Teachers

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**Abstract:** Reflexivity appears to be a key focus when designing teachers' training; therefore, designers and trainers need to plan and put in place situated and proactive learning contexts in which reflexivity is supported by specific participatory devices. During a 1st level master's degree for teachers and educators, based on the Triological Learning Approach, learners are involved in several collaborative activities to create meaningful objects. Divided into 14 groups of four members covering specific roles (the coordinator, the researcher, the storyboarder, and the diarist), the participants collaboratively built a multimedia teaching resource about a chosen methodological–didactic theme. Applying a qualitative approach, this study analyzes the online diaries compiled during the activity to understand its impact as a “meta” boundary object able to support reflexivity on one's professionalism. The content analysis focused on analyzing how objects and practices enabled learning and participation and how students' identity evolved during group work. The results show that a diary may act as a reflexive tool, allowing for the externalization of the processes that underly the construction of individual and collective knowledge and promoting reflection on practices and identity positioning within a community composed of professionals working in educational fields. In the end, practical implications and recommendations are provided to enhance the reflexive diaries both in teachers' training and in the daily practice with students.

**Keywords:** triological learning approach; teachers' training; reflexivity; boundary objects; boundary practices; positioning



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## 1. Introduction

Reflexivity, conceived as a professional's attitude for analysis and reflection on his/her practices, is a recurring theme within the current national and international debate on transversal skills [1,2]. It is concretely defined as the ability to reflect on one's own experience by making inferences and to distance from practice through a recourse to theory, finally ending in the formalization of action knowledge [3]. Thus conceptualized, reflexivity appears to be a key focus when designing teachers' training; therefore, designers (and trainers) need to plan (and put in place) situated and proactive learning contexts in which reflexivity is supported by specific participatory devices [4]. This is the case of the study presented here in which we analyzed the diary-based reflexive practices that took place in a master's degree dedicated to various kinds of educators and inspired by the Triological Learning Approach (TLA) [5].

TLA is based on the idea of learning as a socio-cultural construct [6] arising from the interactions of individuals participating in a community of practice (CoP) [7,8]. In a triological context, knowledge is, first and foremost, a product created through the negotiations of group members who interact to create useful and motivating objects. To this aim, TLA requires an effective integration of individual and collective agency, the mediation

of flexible digital tools, a sustained reflection upon the ongoing learning process, and the cross-contamination of practices between different professional and learning contexts [9].

TLA is applied through six design principles (Table 1), which guide the planning of technology-based teaching and learning activities to facilitate shared engagement with knowledge artifacts.

**Table 1.** The design principle for the Trialogical Learning Approach.

The Design Principle	How to Apply Them
DP1 Organize activities around shared objects	Didactic activities must converge towards the construction of shared objects: <ul style="list-style-type: none"> <li>designed for real uses, thus acting as a bridge between formal learning contexts and workplace contexts</li> <li>embodying the skills that learners need to acquire</li> </ul>
DP2 Supporting integration of personal and collective agency and work	It is necessary to combine individual and group: <ul style="list-style-type: none"> <li>promoting individual and collective responsibility and motivation</li> <li>encouraging the development of relational skills</li> </ul>
DP3 Fostering long-term processes of knowledge advancement	The learning situation should be lengthy enough to allow for the following: <ul style="list-style-type: none"> <li>the iteration of different cycles of the same activities</li> <li>an advancement of knowledge when moving from one version to another of the same knowledge object</li> </ul>
DP4 Emphasizing development and creativity through knowledge transformations and reflection	<ul style="list-style-type: none"> <li>Learning must encompass diverse forms of knowledge, including declarative, procedural, and implicit, presented in various formats, such as text, pictures, multimedia, and case experiences.</li> <li>Reflection should be promoted to enhance learning outcomes and individual and group practices.</li> </ul>
DP5 Promoting cross-fertilization	Establishing connections beyond formal learning contexts and spanning across communities and institutions is crucial for fostering the development of new modes of interaction and the creation of new languages and tools.
DP6 Providing flexible tools for developing artifacts and practices	Learning activities and goals should be underpinned by a conscious use of technologies, led by the teacher who deliberately and flexibly selects technologies that allow students to create and share, reflect, and transform knowledge practices and artifacts.

It is then clear that the trialogical object is not important per se, rather in its being a means to an end: the design of authentic activities to externalize the acquired knowledge and to build a CoP. In this sense, the object can represent a “boundary object” [10] that connects different communities. In such hybrid spaces or ‘third spaces’ [11,12], professionals from different work contexts interact and negotiate around collective concepts, which are functional for boundary crossings between different disciplinary domains as well as for supporting their collaboration towards a common outcome [13,14]. From the final knowledge artifact to be built, TLA thus extends its innovative potential to the knowledge practices, e.g., both “personal and social practices related to working with knowledge” [15] (p. 215), which are more likely to be innovated thanks to the cross-fertilization between communities. Here, the trialogical approach demonstrates its strong links with the Cultural Historical Activity Theory [16], perceiving knowledge as a collaborative construction mediated by cultural and social artifacts and grounded on practical activities [17]. Starting from these theories, TLA favors the use of environments and tools that let individuals create, share, process, transform, and organize objects of learning, thus enabling the reflective transformation of knowledge practices [18].

Furthermore, in the communities of practices, learning is not conceived as a mere acquisition of knowledge but rather as active participation, itself viaticum of identity development. When the learners’ different social worlds meet, collaborate, and cross-fertilize to build new knowledge, each individual’s identity entails an ontological change: their identity actually develops, and they ‘become’ something/someone different [19]

(p. 352). In fact, according to the Dialogical Self Theory [20], the self is composed of different I-positions that are constantly in motion and progressively changing [21], taking on different identity trajectories based on the various contextual variables and resources (tools and people) with which the learners come into contact. Within these dynamics, digital tools and environments hold a mediating role [22] as they enhance the dialogical nature of collaborative learning [23,24].

This study concerns a community of practices of teachers and educators in training called to collaboratively build meaningful objects according to the design principles of the triological approach [9]. This study's first aim is to analyze the role and nature of shared objects and collaborative practices within the individual learning and participation processes as they are reflected upon by the learners through the device we have set up for the training path. Various narrative devices are identified as functional to document and describe personal experiences to elicit reflection on one's own acted professionalism [25]. Within our study, we identified the online diary as a mediator able to support and promote the practitioner's reflexivity. Autobiographical writing in the form of a diary is, in fact, considered a valuable tool for knowledge and identity construction [26]. Moreover, online diaries act as a spokesperson for the various instances that emerge through the group members' discussions and negotiations while constructing concrete objects [27]. The second aim of this study is, therefore, to understand if and how the online diary can represent a meta-boundary object that sustains the overall community of practice while developing new knowledge in the form of artifacts, concepts, and, of course, practices. Upon collective examination, the objectives of this study align with the overarching goal of determining whether and how triological teacher training can act as a catalyst for professional change by eliciting crucial reflective skills.

## 2. Materials and Methods

### 2.1. Context and Materials

The training path described here is a 1st level University Master (1500 h, 12 months), named TASK (Italian acronym for "Technologies for Knowledge Acquisition and Skills Development"), and delivered at a distance (a.a. 2020–2021, UnitelmaSapienza University of Rome, IT) through the MOODLE platform. TASK is aimed at teachers of all levels of compulsory schooling, university professors, educators, and public and private sector trainers. The overall path is divided into five modules, each containing several learning units (LU). The LUs are developed through video lessons, PowerPoint presentations, self-assessment quizzes, and a diversified range of practical, discursive, and authentic activities, the so-called e-tivities [28]. E-tivities are learning activities included in an online training course to promote active participation and knowledge application through the performance of authentic individual or group tasks. The overall path is designed according to the triological design principles so that the learners are required to collaboratively build meaningful objects within a CoP, supported with digital tools and by enhancing continuous reflective practices [29].

Specifically, we investigated the practices aroused within the "Multimedia contest." The activity involved 56 learners—teachers and trainers of different fields—spontaneously organized into 14 groups of four members. Each group had the assignment of creating an original multimedia teaching resource composed of a video pill, an exploratory infographic, and an evaluation quiz. The three micro-objects together build a coherent and articulated resource to become the shared heritage of the present and future communities of the TASK learners, as in TLA vision [5].

The activity lasted approximately 10 weeks and was structured in five phases, each devoted to a specific task (Table 2).

**Table 2.** Activity phases.

Phases	Phase Deadline	Phase Task
phase 1	1 March	Group composition
phase 2	11 March	Topic definition
phase 3	22 March	Object storyboarding
phase 4	2 April	Object implementation
phase 5	10 April	Object first version
phase 6	18 April	Object final version and overall reflection

After the group composition and before beginning the resource design and implementation, the groups had to negotiate the topic around which they would have built their micro-objects by choosing between a learning methodology, an actual school experience, and an educational tool/software.

To support group cooperation and individual responsibility, each group member covered a specific role: the coordinator, the researcher, the storyboarder, and the diarist. Here, we focus on the latter. The learner taking the diarist role (N = 14; M: 1, F: 13) had the assignment of fulfilling an online diary at the end of each phase of the activity (i.e., six fillings). As long as the broad deadline was respected, each diarist chose when to accomplish his/her duty. The diaries were hosted on Google Forms and were composed of two sections:

- (a) diary presentation: diarist's name and group; phase of the activity;
- (b) diary notes for the just-ended activity phase;
- (c) the group strategies (note#1);
- (d) the winning aspects (note#2).

The reason for choosing a semi-structured diary is twofold: On the one hand, directing the participants' reflection towards common topics allowed for us to more easily collect comparable data; on the other hand, semi-structured diaries can be interpreted as standardized forms of boundary objects [30], allowing for members of different communities to share a writing space in which they can just enter the information in a standardized manner that is not dependent on their background, skills, or experience. The diary, in fact, though individually fulfilled, was shared in itinere with each diarist's group mates: each diary was made available to the diarist's group mates only, that is to say that each group had access to just their group diary. An invitation was extended to read and share reflections, doubts, and proposals related to the diarist's contribution. Individual contributions were posted in the group web forum to facilitate the discussion around the common goal and to strengthen the internal sense of community.

Besides the two prompts (Note #1 and Note #2) guiding the diarist's reflection, no additional instructions were provided to the students who did not know beforehand the aims and methods of this study.

## 2.2. Research Questions and Methods

The research questions (RQ) guiding our study are as follows:

- RQ1: How do shared objects and practices enable learning and participation?
- RQ2: How do learners' identities evolve during group work?

On the diaries compiled and collected via Google Forms, an interpretive and naturalistic approach was applied with a content analysis process based on the revised Grounded Theory [31]. The process comprises the following steps:

1. Preparing material for analysis: The diaries were collected and systematized in a grid with separated columns identifying diarists, groups, activity phase, and note#1 and #2. The unit of analysis chosen was the sentence;
2. Deductive coding: A total of 140 notes for each diarist were reviewed by the research group through an open-coded, paragraph-by-paragraph process based on a set of predetermined codes to have a first general view of the data;

3. Inductive coding: Using key concepts and ideas from the RQs and TASK theoretical framework [9], the sentences were categorized and grouped by the research group based on their emerging themes;
4. General refining of the coding schemes: definition of categories and subcategories by the research group;
5. Assigning codes to the text: Using the Excel software, the researchers have input categories and coding that is performed automatically and efficiently.

Specifically, two coding schemes were defined to answer the RQs. The first coding scheme (Table 3) aimed to find answers to RQ1: How do shared objects and practices enable learning and participation? In this sense, the coding scheme was built to initially comprehend any theme the diarists would have included and then to reduce them to the ones useful to answer the RQ. Thus, the themes have been grouped into three main focuses, taking into account not only the research questions but also the theoretical framework of the TASK master’s program [9]: (a) mediation, referring to those aspects perceived as enabling learning; (b) practices, including the group strategies and modus operandi; and (c) training path, a residual group of sentences containing reflection about the master and the activity.

**Table 3.** Theme coding scheme.

Focus	Category	Description
Mediation (M)	Group (M-G)	The diarist links the learning experience to the group
	Object (M-O)	The diarist focuses on the triological object and on the aroused experiences/knowledge/emotions
	Technology (M-T)	Specific tools or software are perceived as a mediator of learning
Practices (P)	Organization (P-O)	The diarist refers to how the group has defined its modus operandi
	Collaboration (P-C)	The diarist describes the effectiveness of the group interaction and cooperation
	Role-Taking (P-R)	The diarist dwells on group roles and on their task performance
Training Path (T)	Contest (T-C)	The diarist refers to the contest
	TASK (T-T)	The diarist refers to the master’s program

The second coding scheme (Table 4) aimed to find answers to RQ2: How do the learners’ identities evolve during group work? To this aim, we initially referred to previous literature about identity positionings in collaborative learning and then adapted the list of dialogical indicators of Ligorio and colleagues [19]. With respect to the original list, we here use the indicator “The Other” to comprehend other voices in the course, voices of others, and educational materials.

**Table 4.** Identity positioning coding scheme.

Indicators	Description
We (W)	The diarist positions him/herself as “we”
The Group (G)	The diarist speaks as a “Group” or about other groups
I (I)	The diarist speaks in 1st person
The Other (O)	The diarist focuses on specific themes using the 3rd person

Once the coding schemes were finalized, two researchers independently analyzed the data to codify the chosen units of analysis. The third researcher intervened to resolve the doubtful cases. The researchers identified and codified 741 units for RQ1 and 717 units for RQ2, reaching a perfect or almost perfect inter-judge agreement (Table 5).

**Table 5.** Inter-judge agreement and Cohen’s kappa for each category system and diary prompt.

Category System	Prompt#1		Prompt#2	
	Inter-Judge Agreement	Cohen’s Kappa	Inter-Judge Agreement	Cohen’s Kappa
Themes	99.74%	0.98 Almost perfect agreement	99.41%	0.96 Almost perfect agreement
Identity Positionings	100%	1 Perfect agreement	100%	1 Perfect agreement

To summarize and interpret the results, the units were then distinguished according to (a) diary note and (b) phase activity. On the one hand, in fact, we were interested in discovering if the diary we structured was a useful reflexive device; on the other hand, we wanted to observe the possible impact of the different tasks to be performed on the group work and, in general, the evolution during the time of the individual reflection.

### 3. Results

In assessing the identified coding schemes, we can preliminarily gauge the depth of the annotated reflections. Each diarist focused on numerous issues and topics for each annotation, delving deeply into the analysis of group behavior and processes, as elaborated in the next two paragraphs.

#### 3.1. RQ1: How Do Shared Objects and Practices Enable Learning and Participation?

Concerning RQ1, Table 6 offers a comprehensive view of the themes emerging from the diaries, considering both the notes and the phases of the activities.

**Table 6.** Theme overall frequencies.

Focus	Category	f	f% per Category	Overall f%
Mediation (M)	Object (M-O)	260	67.89%	35.09%
	Group (M-G)	97	25.33%	13.09%
	Technology (M-T)	26	6.79%	3.51%
<i>Total Mediation (M)</i>		383	100.00%	51.69%
Practices (P)	Collaboration (P-C)	186	64.58%	25.10%
	Role-Taking (P-R)	69	23.96%	9.31%
	Organization (P-O)	33	11.46%	4.45%
<i>Total Practices (P)</i>		288	100.00%	38.87%
Training Path (T)	Contest (T-C)	47	67.14%	6.34%
	TASK (T-T)	23	32.86%	3.10%
<i>Total Training Path (T)</i>		70	100.00%	9.45%
<b>Total</b>		741	100.00%	100.00%

When reflecting upon the group activity, the diarist is strongly focused on the mediating role of specific aspects of the experience (M: 51.69%). Particularly, the dialogical object to be built is perceived as triggering a fruitful learning experience (M-O: 35.09%): “Primarily, the discussion (about the object to be built) focused on innovative learning methodologies because we did not feel as sufficient to just experiment with a tool, rather we wanted to delve deeper into the methodological field of learning” (#105, 10-03, phase#2) (Each unit is identified by its number, date, and activity phase).

Reflection on practices is also consistent (P: 38.87%), with collaboration being the second single theme that occurs (P-C: 25.10%): “Also in this phase, as in the previous ones, the group chose to work in a constant and as frequent collaboration as possible: exchange

of ideas, feedback, and confrontation, accompanied by synchronous working with shared screen" (#217, 18-04, phase#6).

Taking a deep look at the specific reflection triggers, that is, the two diary notes, note#1 (Table 7) that is focused on the group strategies seems to elicit a congruent reflection: The practices are here perceived as more central (P: 43.39%), particularly the collaboration (P-C: 30.35%): "The group chose to store any shared ideas and materials in a Classroom course which we consider as easier to document our organization and discussion, even and especially in asynchronous mode, thus helping us to make decisions" (#173, 22-03, phase#3).

**Table 7.** Themes: note#1.

Focus	Category	f% per Category	Overall f%
Mediation (M)	Object (M-O)	72.73%	34.24%
	Group (M-G)	18.18%	8.56%
	Technology (M-T)	9.09%	4.28%
<i>Total Mediation (M)</i>		100.00%	47.08%
Practices (P)	Collaboration (P-C)	69.96%	30.35%
	Role-Taking (P-R)	19.73%	8.56%
	Organization (P-O)	10.31%	4.47%
<i>Total Practices (P)</i>		100.00%	43.39%
Training Path (T)	Contest (T-C)	65.31%	6.23%
	TASK (T-T)	34.69%	3.31%
<i>Total Training Path (T)</i>		100.00%	9.53%
Total		100.00%	100.00%

Nevertheless, when asked to identify the winning aspects of one's own group (note#2, Table 8), the diarists come back to the mediation (M: 62.11%), this time in the shape of the group (M-G: 37.00%): "An 'afflatus' immediately enveloped us: no stress, total disinterest in exaggerated racing aspects, that is not letting ourselves get caught up in the anxiety of the race for 'victory' and also a certain playful spirit that doesn't hurt" (#7, 04-03, phase#1).

**Table 8.** Themes: note#2.

Focus	Category	f% per Category	Overall f%
Mediation (M)	Group (M-G)	59.57%	37.00%
	Object (M-O)	37.59%	23.35%
	Technology (M-T)	2.84%	1.76%
<i>Total Mediation (M)</i>		100.00%	62.11%
Practices (P)	Organization (P-O)	46.15%	13.22%
	Collaboration (P-C)	38.46%	11.01%
	Role-Taking (P-R)	15.38%	4.41%
<i>Total Practices (P)</i>		100.00%	28.63%
Training Path (T)	TASK (T-T)	71.43%	6.61%
	Contest (T-C)	28.57%	2.64%
<i>Total Training Path (T)</i>		100.00%	9.25%
Total		100.00%	100.00%

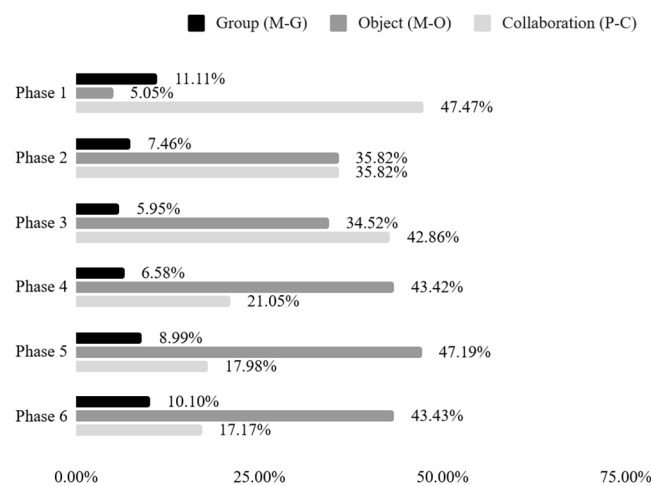
When solicited to reflect upon the group modus operandi during time (note#1, Table 9; Graph.1), the diarists, as expected, focus more on practices as collaboration and organization ("To confront each other, in addition to the WhatsApp group, we have established to hold periodic meetings via Google Video Call Meet."—#21, 03-03, phase#1) in the first part of the activity (phase#1: Group composition), whereas the object becomes salient when

the activity comes alive, from phase#4 of object implementation to phase#6 of object final version and overall reflection.

**Table 9.** Themes during time: note#1.

Focus	Categories	Phases of the Activity						Total for Category
		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
Mediation (M)	Group (M-G)	11.11%	7.46%	5.95%	6.58%	8.99%	10.10%	18.18%
	Object (M-O)	5.05%	35.82%	34.52%	43.42%	47.19%	43.43%	72.73%
	Technology (M-T)	2.02%	7.46%	4.76%	2.63%	6.67%	3.03%	9.09%
<i>Total Mediation (M)</i>		<i>7.44%</i>	<i>14.05%</i>	<i>15.70%</i>	<i>16.53%</i>	<i>23.14%</i>	<i>23.14%</i>	<i>47.08%</i>
Practices (P)	Organization (P-O)	19.19%	1.49%	1.19%	1.32%	1.12%	0%	10.31%
	Collaboration (P-C)	47.47%	35.82%	42.86%	21.05%	17.98%	17.17%	69.96%
	Role-Taking (P-R)	11.11%	4.48%	8.33%	10.53%	8.99%	7.07%	19.73%
<i>Total Practices (P)</i>		<i>34.53%</i>	<i>12.56%</i>	<i>19.73%</i>	<i>11.21%</i>	<i>11.21%</i>	<i>10.76%</i>	<i>43.39%</i>
Training Path (T)	TASK (T-T)	1.01%	2.99%	0%	6.58%	3.77%	6.06%	34.69%
	Contest (T-C)	3.03%	4.48%	2.38%	7.89%	5.62%	13.13%	65.31%
<i>Total Training Path (T)</i>		<i>8.16%</i>	<i>10.20%</i>	<i>4.08%</i>	<i>22.45%</i>	<i>16.33%</i>	<i>38.78%</i>	<i>9.53%</i>
<i>Total for phase</i>		<i>19.26%</i>	<i>13.04%</i>	<i>16.34%</i>	<i>14.79%</i>	<i>17.32%</i>	<i>19.26%</i>	<i>100.00%</i>

Nevertheless, collaboration remains central until phase#3 of the object storyboarding (Figure 1). The lesser centrality of collaboration in the following phases can also be traced back to the fact that, during the creation of the three micro-objects, each group member is dedicated individually to them.



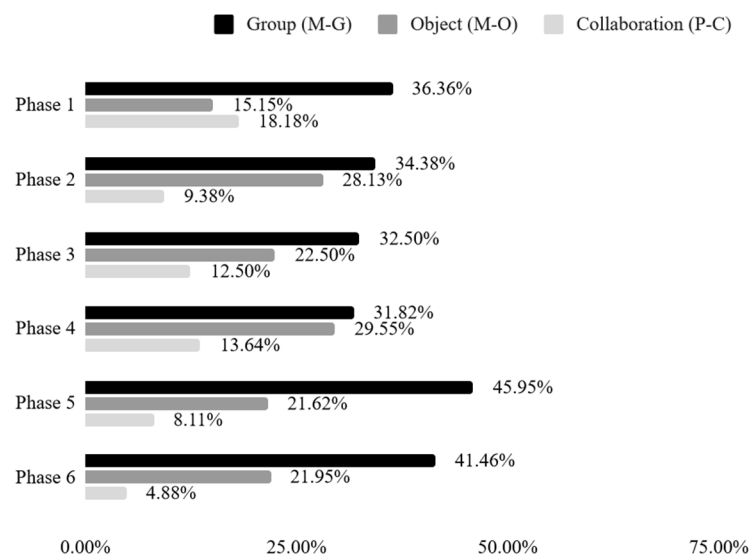
**Figure 1.** Themes most focalized during time: note#1.

The mediation of the group is perceived as the true winning aspect throughout the activity (Table 10, Figure 2), but particularly during the phase aimed to finalize the first version of the object (M-G, phase#5: 45.95%; “The ability to work even from a distance: the group was able to confront each choice, and no one was entrenched in predetermined positions.”—#171, 10-04, phase#5) and when reflecting on the overall experience (M-G, phase#6: 41.46%): “The always fruitful and stimulating discussion, the willingness and serenity in accepting criticism and proposed changes” (#208, 18-04, phase#6).



**Table 10.** Themes during time: note#2.

		Phases of the Activity						Total for Category
Focus	Categories	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
Mediation (M)	Group (M-G)	36.36%	34.38%	32.50%	31.82%	45.95%	41.46%	59.57%
	Object (M-O)	15.15%	28.13%	22.50%	29.55%	21.62%	21.95%	37.59%
	Technology (M-T)	0%	0%	5.00%	0%	2.70%	2.44%	2.84%
<i>Total Mediation (M)</i>		<i>12.06%</i>	<i>14.18%</i>	<i>17.02%</i>	<i>19.15%</i>	<i>18.44%</i>	<i>19.15%</i>	<i>62.11%</i>
Practices (P)	Organization (P-O)	21.21%	21.88%	12.50%	15.91%	2.70%	7.32%	46.15%
	Collaboration (P-C)	18.18%	9.38%	12.50%	13.64%	8.11%	4.88%	38.46%
	Role-Taking (P-R)	3.03%	0%	2.50%	4.55%	8.11%	7.32%	15.38%
<i>Total Practices (P)</i>		<i>21.54%</i>	<i>15.38%</i>	<i>1.92%</i>	<i>23.08%</i>	<i>10.77%</i>	<i>12.31%</i>	<i>28.63%</i>
Training Path (T)	TASK (T-T)	6.06%	3.13%	7.50%	2.27%	8.11%	12.20%	71.43%
	Contest (T-C)	0	3.13%	5.00%	2.27%	2.70%	2.44%	28.57%
<i>Total Training Path (T)</i>		<i>9.52%</i>	<i>9.52%</i>	<i>23.81%</i>	<i>9.52%</i>	<i>19.05%</i>	<i>28.57%</i>	<i>9.25%</i>
<i>Total for phase</i>		<i>14.54%</i>	<i>14.10%</i>	<i>17.62%</i>	<i>19.38%</i>	<i>16.30%</i>	<i>18.06%</i>	<i>100.00%</i>



**Figure 2.** Themes most focalized during time: note#2.

3.2. RQ2: How Do Learners’ Identities Evolve during Group Work?

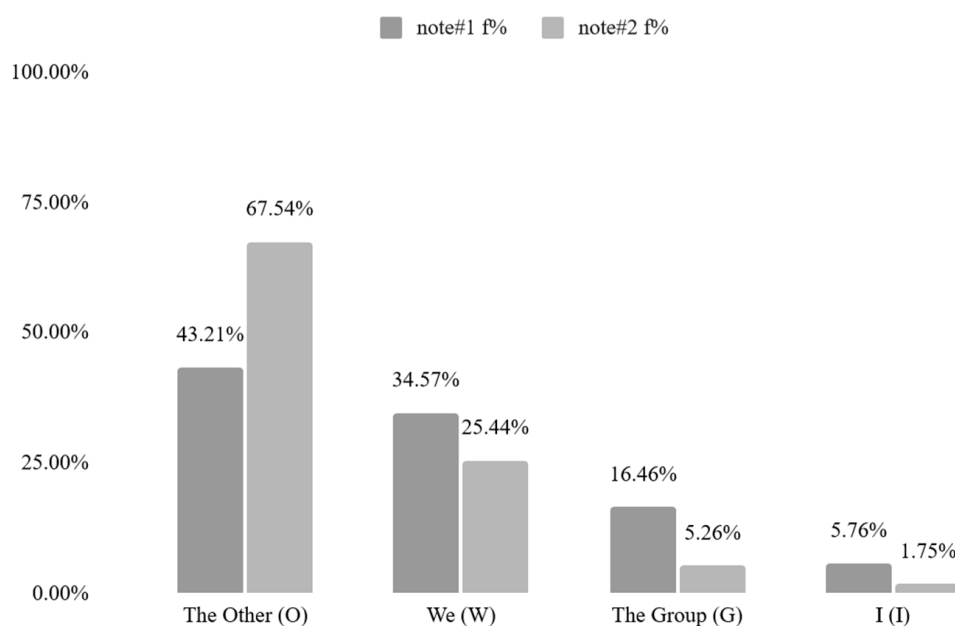
The learners’ identity positioning (Table 11) when covering the diarist role is mainly focused on ‘The Other’ (O: 50.77%), be it a colleague’s behavior, an educational material, or the voice of the other in the activity [19]: “Our producer, with her precision and assertiveness, is undoubtedly the driving force of the group” (#132, 11-03, phase#1).

When not focused on ‘The Other’, the diarists maintain a ‘We’ position (“We all contributed to the discussion. We raised doubts and sought answers together.”—#43, 10-03, phase#2) or, at least, ‘The Group’ one (“The group discussed the structure and decided that a detailed storyboard needs to be drafted. By mutual agreement, a table was uploaded on Moodle”—#403, 16-04, phase#2). The I position is residual (“As coordinator, I created a WhatsApp group to exchange messages to get to know each other and also for internal organization and division of roles”—#64, 07-03, phase#1). It is then clear how the diarist seems to take on an observer position by looking at his/her group from the outside and providing his/her mates with a voice.

**Table 11.** Positioning overall occurrences.

Positioning	f	f%
The Other (O)	364	50.77%
We (W)	226	31.52%
The Group (G)	92	12.83%
I (I)	35	4.88%
Total	717	100.00%

Interestingly, ‘The Other’ is even more preminent when the diarist is solicited to identify the winning aspects of his/her own group (Figure 3) “A collaborative spirit, a willingness to share skills, a practical sense and a belief that it is much easier to learn if you have fun” (#15, 06-03, phase#1).



**Figure 3.** Positioning: cfr note#1 and note#2.

Positioning during time (Table 12, Figure 4) reveals how ‘The Other’ is the core focus in phase#4 (O: 56.34%) and #5 (O: 57.69%) of the activity, whereas ‘We’ and—in a way—‘The Group’ are more salient in the initial phases (W: 42.11% phase#1, 44.71%: phase#3); “We are discussing contents from which we will need to design the whole activity, starting with research questions shared by all group members.” (#203, 22-03, phase#3).

**Table 12.** Positioning during time: note#1.

Positioning	Activity Phases						Total for Category
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
	f%						
The Other (O)	21.05%	45.45%	35.29%	56.34%	57.69%	49.45%	43.21%
We (W)	42.11%	37.88%	44.71%	23.94%	25.64%	30.77%	34.57%
The Group (G)	27.37%	13.64%	15.29%	12.68%	12.82%	14.29%	16.46%
I (I)	9.47%	3.03%	4.71%	7.04%	3.85%	5.49%	5.76%
Total for phase	19.55%	13.58%	17.49%	14.61%	16.05%	18.72%	100.00%

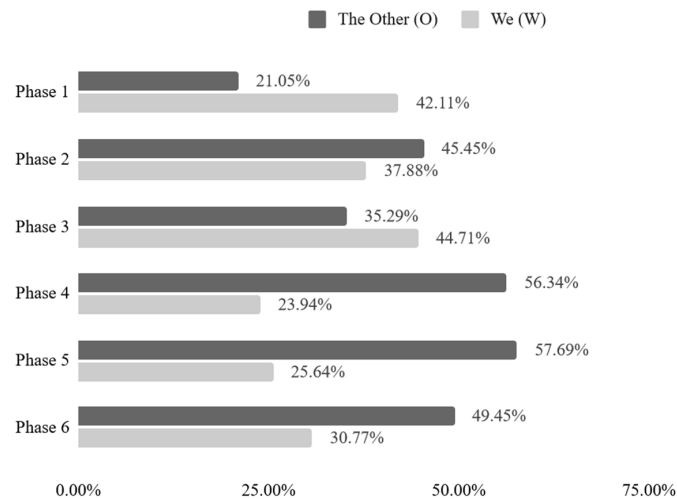


Figure 4. Positioning most focalized during time: note#1.

Similarly, when reflecting upon the winning aspects (Table 13, Figure 5), the ‘We’ position is more salient at the beginning of the activity, during phase#1 and #2 dedicated to ‘The Group’ composition (W: 36.36%; “I also want to emphasize that we Dimonios approach this educational experience seriously but at the same time we manage to have fun”—#12, 05-03, phase#1) and topic definition (30.30%; “we all felt that the topic responds to a need that we first feel in our own contexts and that we would all like to see realized (or try to realize) in our own institutions.”—#51, 11-03, phase#2). ‘The Other’, instead, stands out after phase 5 of object first version (O: 86.11%; “it is needed an ongoing alignment among the three micro-objects during their construction, both in terms of logic and content and from a graphical point of view.”—#158, 10-04, phase#5).

Table 13. Positioning during time: note#2.

Positioning	Activity Phases						Total for Category
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	
The Other (O)	51.52%	63.64%	72.50%	65.91%	86.11%	64.29%	67.54%
We (W)	36.36%	30.30%	22.50%	25.00%	11.11%	28.57%	25.44%
The Group (G)	9.09%	3.03%	5.00%	6.82%	2.78%	4.76%	5.26%
I (I)	1.75%	3.03%	0%	2.27%	0%	2.38%	1.75%
Total for phase	14.47%	14.47%	17.54%	19.30%	15.79%	18.42%	100.00%

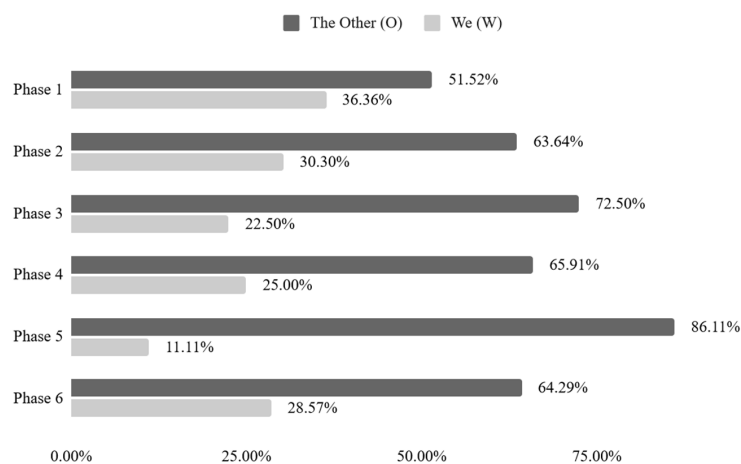


Figure 5. Positioning most focalized during time: note#2.

#### 4. Discussion

As for our first research question, the reflections of teachers and educators covering the diarist role reveal the centrality of the dialogical object and of collaboration as mediators of fruitful learning and participation in the community of professionals who share the same training path [10,18]. In this sense, they may represent boundary objects and practices that connect different communities, the so-called boundary territories, in which “practitioners must move across boundaries to seek and give help, to find information and tools wherever they happen to be available” [32] (p. 332). Furthermore, group negotiation and organizational processes described by the diarists evolve over time and coherently with the activity; after all, “the practice, negotiated and developed through the use of boundary objects is not static, rather it is a lively practice, constantly in change, enabling the organization to evolve and, so, to survive” [33] (p. 8). Another central component of the experience is ‘The Group’, understood as a precious space of learning and exchange, similar to the membrane of a living organism [33] (p. 7). Boundary objects, in fact, facilitate such border transitions and crossings by promoting exchange, collaboration, and knowledge sharing between professionals belonging to different communities of practice [34–36] and by supporting the negotiation of different points of view [19].

Concerning our second research question, the dominance of the positionings ‘The Other’ (50.77%) and ‘We’ (31.52%) over ‘The group’ (12.83%) and ‘I’ (4.88%) testifies to the progressive development of the ‘social’ component of the individual’s identity. It seems to us that well-structured collaborative and constructive contexts favor precisely “the construction of a collective knowledge founded on the sense of an ‘I’ as a part of a new ‘We’, rather than learning as the patrimony of single individuals” [19] (p. 354). It is this new ‘We’ that values, among other things, not only collective knowledge but also the individuality of an ‘I’ as a significant member of the group.

Beyond the merit of the diaries’ contents, the results seem to suggest that the online form we have structured may represent a boundary device able to support a fruitful reflection about one’s own learning trajectory. Fulfilled at the beginning, in itinere, and at the end of the collaborative object building, the semi-structured shared diary can be a means for the conceptualization of one’s own and others’ knowledge and for the representation of values, objectives, and meanings [36], in the end supporting the acquisition of reflexive and professionalizing skills. The diarist, in fact, thanks to the structure and timing of the online diary, is properly put in the position to reflect both on the construction and improvement of the shared objects as well as on the process activated and involved when participating in a community of practice in terms of developed knowledge and skills and individual and collective emotions.

#### 5. Conclusions and Practical Implications

Boundary objects are complex and dynamic concepts that support long-term processes of knowledge advancement. This is even more true when they require, as in the Dialogical Learning Approach, the hybridization of practices, relying on the presence of a multidisciplinary team, putting together different points of view and knowledge, skills, and competencies. The co-constructed dialogical object, being a boundary object, reclaims its social role of a network connecting different communities, and “promoting the exchange of discursive repertoires and work practices, activating a virtuous spiral of new learning and development opportunities at both the individual and community levels.” [37] (p. 84)

Boundary objects and practices may then enhance new identity positioning [19,20] and a powerful reflection [25], leading the professionals to question their own methodological design as well as the co-constructed products, constantly re-orienting their own actions, their I-positions, and their learning. The learners, in fact, move from a theoretical-conceptual knowledge to a practical one; then, after having collectively revised and improved the object, they come back to the theory, thus emphasizing the development of learning and creativity.

Considering the purpose of our study, therefore, we think that online diaries as standardized forms of boundary objects may represent, more than others, functional boundary objects for the professionals involved in the study, i.e., teachers, trainers, and educators from different domains, levels, and disciplines who intend to exchange ideas, concepts, and instruments from seemingly unrelated domains into the domain of focal inquiry, triggering practices and reflective processes on themselves as members of a group and on their own professionalizing practices [26].

With this dual connotation, the structured online diary is thus configured as a reflexive tool that allows for the externalization of the processes underlying the construction of individual and collective knowledge, promoting reflection on practices and on one's own and others' positioning within a community composed of professionals working in related fields: a path that leads to awareness and responsibility towards one's own identity and professionalizing growth path [38]. The adoption of a similar reflective device serves as an enabling self-observational tool that not only enhances reflection but also one's own agency and identity as a result of belonging to the community of practice. The reflective diary would, in fact, stimulate the teachers' inclination to reflect on their own research-training process and positioning within the working group, whether represented by the micro, meso, or macro context of belonging [39], whether connected to the world of research. Furthermore, the sharing of teachers' personal reflective diaries, seen as a 'warm' documentation tool in contrast to institutional and merely bureaucratic ones, would be an effective means of peer-to-peer practices in research and training contexts, also promoting constructive and fruitful dialogue among professionals towards the peer feedback strategy [4].

Altogether, we believe that the results of the current study may have strong practical implications in both designing teacher training aimed at developing an appropriate habitus of reflexivity and research [4] as well as in the daily classroom practice. In the first case, training paths should always require the continuous use of individual though shared semi-structured diaries (see paragraph 2), serving the dual purpose of documenting and analyzing the learning practices and processes being performed during the training—as it has been shown in this study. Moreover, during the training, teachers could be invited to use a daily classroom diary before, during, and after implementing a specific activity or strategy in the classroom. Its systematic compilation would elucidate the implicit theories of the teacher's actions and habitus [40], encouraging a continuous reflection and recursive change of their practices in a backward design perspective [41]. In the second case, having experienced first-hand the positive impact of this device on their own professionalism, educators and trainers could then incorporate the use of online diaries as reflexive tools in their program, bearing in mind some general recommendations: (a) Each student must be able to experiment with the use of the diary, possibly taking turns; (b) the compilation of the diary must be structured in such a way as to reduce sterile criticism and encourage constructive reflection towards aspects considered important for individual and group learning; (c) the collegial sharing and reading of the diaries must be mediated and guided by the teacher; and (d) the practice is more effective the longer it lasts.

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