Lesson Study in initial training: an interdisciplinary academic experience. A case study in Spain

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Abstract

Purpose – This paper focuses on analysis of the incorporation of a Lesson Study cycle within the university training proposal, as a teaching strategy in initial training in the Infant Education Degree.

Design/methodology/approach – Qualitative research was conducted through a case study methodology.

Findings – Proposing training strategies based on this methodology encourages both the reconstruction of future teachers' practical knowledge and also adequate professional development from initial training.

Research limitations/implications – The main constraint in the study was the cost-benefit ratio, since this experience has required significant practical and emotional dedication by the people involved, while the expected results have only been partially evident in the students. This would seem to imply that the strategy requires continuity over time in order for future education professionals to take it fully on board.

Practical implications – More continuity in such experiences would be required in order to fully analyse their actual value. To this end, the experiences need to be more closely related to the university curriculum, and there must be greater coordination between the subjects in order to ensure a holistic approach to LS.

Originality/value – This article sets out an LS experience as a collaborative action-research strategy that promotes the reconstruction of students' practical knowledge and their professional development in initial training.

Keywords Lesson Study, Higher education, Professional development, Training strategies, Initial training, Qualitative research

Paper type Research paper

Introduction

Today's society demands reflective professionals committed to the teaching profession (García and Castro, 2012; Korthaguen, 2010; Perrenoud, 2008). Such commitment must be encouraged and developed from initial training, since future Infant Education teachers need to prepare themselves to work in an ever-changing, unpredictable environment (Pérez, 2012; Marcelo, 2001; Peña and Pérez, 2019). Initial training is therefore an ideal setting for future teachers to rebuild their practical knowledge through mutual observation and in-depth reflection in university classrooms, reconstituting all they have learned and experienced (Marín and García, 2016; Pérez, 2012). Such training would reveal the distance that separates their espoused theories – built from theoretical concepts acquired during initial training – and their theories-in-use, as built in their socialisation process at school (Pérez and Soto, 2015), in order to develop higher-order learning in which in-depth reflection and critical analysis are key (Soto, 2016).

From this position, we need to consider an integrated, emergent spiral curriculum in which university students have the opportunity to construct their own curriculum based on their

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educational needs, and to go back in greater depth whenever deemed necessary (Bruner, 1991); training is therefore built around teaching models focused on students' autonomous learning (Malaguzzi, 2001; Díez, 2007) while encouraging a shift from teaching as transmission to teaching as understanding (Lewis *et al.*, 2004). LS allows the curriculum to be organised around real, authentic tasks (Henderson, 2014) in which students can face real practical problems, analyse them, understand them in depth and come up with alternative answers (Wang, 2013), which implies active participation and involvement in the teaching-learning process. Practical knowledge (Pérez, 2012) can be defined as that which is based principally on tacit patterns, and which to some extent conditions teachers' action and their cognitive processes and procedures. This reconstruction process becomes increasingly complex as individuals expand their context of relationships and experiences and their participation in social and critical culture. Such knowledge is what Schön (1998) calls "knowledge in action", i.e. knowledge that is revealed in everyday actions, whether externally observable or in private thoughts, but which, paradoxically, is seldom verbalised. Particularly relevant here is Polanyi's (1983, p. 3) affirmation related to the embodiment of this type of knowledge: "When we incorporate something into our tacit knowledge, we also incorporate it into our body, meaning we come to live with it". Practical knowledge is therefore key to the transformation of practice.

A range of national and international research projects (Elliott, 2012; Suzuki, 2012; Cheung and Wong, 2014; Dudley, 2012; Lewis, 2009; Pena *et al.*, 2015; Rasmussen, 2016; Ní Shúilleabháin, 2015; Bahn, 2018) have shown that LS is a very powerful training strategy for both initial and in-service teacher training. This work focuses on using a case study to further examine the training potential of LS for initial training of a group of prospective Infant Education teachers. To this end, a Lesson Study cycle based on seven different phases was developed (Define the problem; Design; Develop Experimental Lesson 1; Analyse; Redesign; Develop Experimental Lesson 2; Analyse; and Disseminate in an extended context) in the practical part of year one subjects Didactics of Infant Education and Towards an Inclusive School. These subjects had an average of 60 students enrolled, with 3–4 h of on-campus work per week. Furthermore, both subjects shared individual assessment mechanisms through a virtual reflective portfolio and close tutoring of the groups by the two teachers, along with several joint sessions in order to work on contents and related procedures.

The evidence that emerged from the experience was collected by: (1) Observing and transcribing the group meetings carried out by one of the groups (chosen as the focal point); (2) Carrying out interviews with the participating students before, during and after the experience, and; (3) Analysing the participants' entries in their Portfolios, along with other tasks developed during the experience. These data provide the structure of this article, which begins by relating the theory framework and research questions, then continuing with a short description of the research design, and ending with a presentation of the results of this Lesson Study experience in initial training.

Theoretical framework and research questions

Our overriding principle as university teachers is to give students the time and space necessary to develop their professional competencies in line with cooperative cyclical strategies. As mentioned, this training context will allow a fluid dialogue between understanding and interpreting the contents worked on in the theory-based part of the subjects studied, along with practical training in which students make their own decisions in collaboration with others, with these, in turn, becoming the focus of their analyses (Mayorga and Madrid, 2015). Lesson Study is proposed as a powerful training methodology which, thanks to its cyclical nature and its cooperative and reflective essence, can be used to improve educational practice (Hiebert *et al.*, 2003; Soto *et al.*, 2015) based on the shared action and

reflection processes that come into play during experimentation and action. We refer to processes that encourage this to-and-fro between reflection and action as theorising practice (Hagger and Hazel, 2006) and experiencing theory (Korthagen *et al.*, 2006). Both processes are key to the progressive reconstruction of practical teaching knowledge (Pena *et al.*, 2015; Soto *et al.*, 2015), closely linking future teachers' professional development to curricular experimentation, cooperative self-training and the development of professional competencies for teaching (Pérez *et al.*, 2015; Stenhouse, 1975).

After developing an LS experience, Cajkler *et al.* (2013) showed that this methodology during initial training encourages team building and practical training communities. Other studies have shown that implementing LS improves students' culture, practice, beliefs, expectations and learning (Dudley *et al.*, 2019). Moreover, Wilson and Sharimova (2019), after carrying out a pilot study in Kazakhstan based on improving the education system by implementing LS, concluded that this methodology provided participants with the opportunity to think and make collaborative judgements which had a real effect on teaching practice. These authors state that practice can only be changed by reflecting on what happens in the classroom, and in having both the skills and the time needed to analyse the effect that learning has on pupils.

Moreover, several authors point to issues around the lack of time and the work overload involved in implementing this training strategy (Wake *et al.*, 2013; Seleznyov, 2020). A study by Godfrey *et al.* (2019) to ascertain the impact of LS, based on 133 primary and secondary school teachers, concluded that participation in LS was lower when teachers had to increase their workload, making it necessary to focus on the "learning object". Similarly, after carrying out a longitudinal case study lasting 5 years at a school in England, Seleznyov (2020) concluded that the LS methodology faces important challenges: the lack of structures and systems to accommodate the methodology; the difficulty in demonstrating its short-term impact; the fact that teachers do not possess sufficient research skills; the scarcity of access to learning materials; and pressures around ensuring accountability.

This study analyses the implementation of the LS methodology in a coordinated initial training experience in a range of university subjects, with a view to finding processes related to theorisation of practice and experimentation of theory. The ultimate goal is to ensure professional teaching competencies based on cooperation and reflection, therefore bringing the training more in line with the pedagogical theories dealt with in the subjects. The following research questions were put forward, with a view to answering them after the experience: Does LS allow the reconstruction of the practical knowledge of future Infant Education teachers?

Research design

During academic year 2018–2019, qualitative research was carried out through a case study methodology with students from year one of the Infant Education degree (second semester), jointly coordinating two subjects. The research was characterised by the systematisation of the process, defined in 7 phases of LS. Data were collected in a total of 19 work sessions from February to June. As is typical of LS, the cycle included an initial and an improved proposal in which students played different roles, firstly as observers of children's learning and secondly as teachers, thus creating an excellent opportunity for contrast, reflection and cooperation. The educational proposal designed by the university students was a didactic workshop which they developed with two groups of around 50 three- and four-year-old schoolchildren, who would come to the university on set days in order to carry out the two Experimental Lessons. This design would be accompanied by learning and reflection on the theoretical contents of the subjects Didactics (Education and Socialisation; Image of childhood; Doyle's Ecological Model; and Curriculum of the Infant Education Stage) and Inclusion (Frameworks and Strategies to Attend to Diversity). The topic for the Experimental Lesson ("Healthy food

workshop") was selected after studying and analysing the needs of the context of the Infant Education classroom. This topic envisaged a holistic curriculum in order to develop two of the three key competencies schools should look to develop in students: the ability to think, act and live autonomously, and the ability to live and coexist in increasingly heterogeneous human groups (Pérez, 2012).

Practical training was carried out at the university itself, thus facilitating the link between university and school (Elipane, 2012). The data were analysed on the basis of an emerging category system. Table 1 shows a chronological summary of the experience and the data collection instruments involved:

In Phase 1, the case group was given the following list of questions, in order to identify needs of preschool children and define the problem:

(1) What are we most interested in learning? What do we find most difficult about being a teacher? What do we need to know in order to do our jobs well as teachers? What areas of improvement do we see in Infant Education? What are the needs and interests of Infant Education pupils? What aspects of their learning do we think could be better addressed?

With regard to Phase 2 (Design of the Experimental Lesson), the prospective teachers were given the guide template shown in Table 2, helping them to design the workshop in accordance with the development of competencies among Infant Education pupils.

The strategy to be used to collect data on preschool children's learning was also drafted in this design phase (Phase 2), as well as coming up with a proposal that would respond to the needs raised in Phase 1. To this end, in session 10 the prospective teachers had the opportunity

PRE-LESSON STUDY		
Date	Activity carried out	
(20/02/2019)	Pre-individual and group interview	
LESSON STUDY		
Session and date	**Subject**	**Activity carried out**
Session 1 (19/02/2019)	Didactics	Present the LS and SL proposal to the group
Session 2 (26/02/2019)	Didactics	Think of questions to ask children during the video call
Session 3 (05/03/2019)	Didactics	Video call to the children
Session 4 (07/03/2019)	Inclusion	*Phase 1.* Aims as teachers, and pupils' needs
Session 5 (14/03/2019)	Inclusion	Aims as teachers, and pupils' needs
Session 6 (19/03/2019)	Didactics	*Phase 2.* Design competencies and workshop goals
Session 7 (26/03/2019)	Didactics	Design contents and workshop methodology
Session 8 (28/03/2019)	Inclusion	Review the design
Session 9 (11/04/2019)	Inclusion	Design the teaching role
Session 10 (23/04/2019)	Didactics	Design the observers table
Session 11 (25/04/2019)	Inclusion	Design the workshop evaluation
Session 12 (30/04/2019)	Didactics	Pool the designs
Session 13 (09/05/2019)	Inclusion	Feedback on the design and run-through of the experience
Session 14 (14/05/2019)	Didactics	*Phase 3.* Experimental Session 1
Session 15 (16/05/2019)	Inclusion	*Phase 4.* Analyse and redesign Experimental Session 1
Session 16 (23/05/2019)	Inclusion	*Phase 5.* Experimental Session 2
Session 17 (28/05/2019)	Didactics	*Phase 6.* Analyse Experimental Session 2
Session 18 (04/06/2019)	Didactics	Conclusions and evaluation of the experience (Evalu-Art)
Session 19 (06/06/2019)	Inclusion	*Phase 7.* Disseminate the experience in an expanded context
POST-LESSON STUDY		
Date	Activity carried out	
(18/06/2019)	Post-individual and group interview	

Table 1. Chronological summary of the experience and the data collection instruments involved

Table 2.
Template used for the Experimental Lesson design phase

·L·E·S·S·O·N S·T·U·D·Y· (Support Material)	
Based on the needs detected in children, our initial purposes as a group are the following:	
Target (Competencies)	
Contents	Conceptual
	Procedural
	Attitudinal
Methodology	*Here, in addition to explaining the methodological principles on the workshop, you must describe what it will consist of:*

to take part in a Pedagogical Documentation Workshop (Hoyuelos, 2007). The aim of this workshop was to help prospective teachers refine their views of childhood and of teaching-learning processes, helping them to become more attentive and serene, thus allowing them to contrast their impressions or "intuitive" statements with the pedagogical evidence collected. Thanks to this workshop and the knowledge acquired in the subjects so far, in session 11 they began to design observation charts, both of their own performance as teachers and also showing the children's learning processes (one of the overall goals of the Lesson Study).

Moreover, the template shown in Figure 1 was used for Phase 4 (Redesigning the proposal) in order to focus the improvement on those aspects that are part of Doyle's ecological model, and give greater relevance to the theory worked on in the subjects.

The data were used to carry out an inductive analysis based on the written documents, interviews, minutes, etc. and on an observational analysis of the recordings, which was then used to ponder to what extent practical knowledge had been reconstructed among participants over the course of this experience.

Participants

To develop the research, it was agreed to select a case group of 6 students from the class. The case group was chosen as of the second week of classes, following an initial interview with the group in order to check students' availability and disposition. The following selection criteria were taken into account: the group's openness and positive predisposition towards the proposal, regular attendance at class sessions, internal cohesion and even the outstanding maturity of some of the members of the group.

Information collection tools

With regard to the data collection instruments, it is worthwhile reflecting on the complexity of the sources, data and information analysed, all of which give this study its form, content, structure, reliability and rigour. Two semi-structured interviews were carried out (one before and one after the experience), obtaining data in relation to the progression of students' image of childhood, their idea of the teaching role, their attitudes regarding the didactic design of the workshop, etc., along with a range of systematic observations which were recorded on video and audio (both in the working sessions and in the Experimental Lessons), and, finally, documentary analysis of the students' portfolios and the minutes of the work meetings (see Table 3). In all cases, content analysis was carried out based on the research questions.

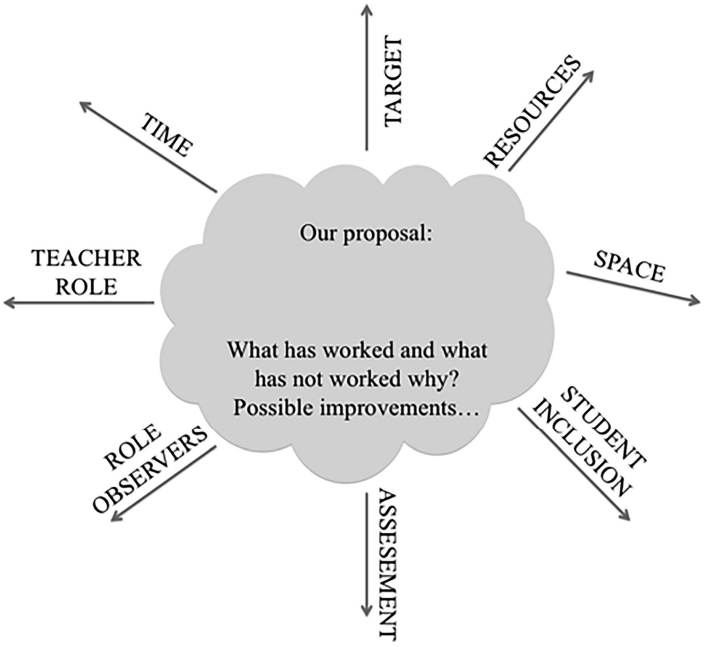

Figure 1. Supporting material for Phase 4. Redesigning the training proposal

Main data collection instruments		Quantity
Questionnaires/Interviews	Closed questionnaires	2 (Initial and final)
	Recorded group interviews	3 (Initial, intermediate and final)
	Recorded individual interviews	2
Observations and audio and video recordings	Large group work sessions	7
	Small group work sessions	12
Paper documents	Portfolios	6
	Minutes of working meetings	9

Table 3. Information collection tools

Prior to the study, all students read and signed an informed consent document in which they were informed that their data would be used anonymously and for academic purposes.

Results

The first category that emerges from the analysis was that LS allows university students to experience authentic tasks that incorporate what they truly think, feel and do in each of the phases. These tasks respond to the need to design and recreate contexts which trainee teachers can live and experience; in short, where they can enter into action and relationships. This purpose is described and reasoned at the start of the subjects, in order to justify the nature of the group work proposal (Lesson Study) to be carried out by the university students. A core aspect of these authentic tasks is the relevance and interdisciplinarity of knowledge, which crosses and relates the contents of the two subjects – sometimes singular and sometimes systemic – in order to understand and analyse the selected educational practice (Soto *et al.*, 2021). These tasks, together with the processes facilitated by each of the phases of

LS, allow them to experience processes of theorisation of practice and experimentation of theory (Soto *et al.*, 2015). This strategy of connecting university and school allows us to focus on childhood (Caparros, 2015) and on children's real needs, interests and motivations and, from there, to start modifying educational practice. Furthermore, those taking part in the study stated that this initial contact with Infant School children helped motivate them, since on many occasions it was the first time they had related directly to pupils in these age groups.

This participation in the Lesson Study experience contributed to relevant learning for university students in:

(1) Evolution in reconstructing the image of childhood

From the very beginning, the group showed a lack of expectation around pupils, with their dialogues expressing ideas such the need for teachers to "measure" their vocabulary and bring their language "down to pupil level", simplifying both the content and form of their language to make it more "childish". They therefore failed to consider the risk of falling into a relationship which, given the lack of a suitably mature language model, would be bland and unnatural, treating children as a uniform or stereotyped group:

> *E: They don't know the parts of the body. That's right, they're still very little… […]*
>
> *E: […] They love pirates.* (Case group observation, Phase 2).

This homogenising image was also evident in relation to the methodology. For example, they proposed prototypical children's education activities such as drawing, colouring or cutting out. Such activities were decontextualised from holistic psycho-evolutionary development and the particular needs of the group of children that would come to the university, despite the fact students held a video call with the children in order to identify such needs beforehand.

Moreover, when discussing the criteria for assessing the activities (considering them "good" or "bad"), this was done from an adult perspective, without taking into account the children's level of development or particular learning processes (progress, motivation, help given or requested, etc.):

> *P: The eyes don't go there. They go here, see? [addressing a girl who is making a lion out of pieces of fruit].* (Case group observation, Phase 3).

However, in the first Experimental Lesson (EL1), horizontal interaction with the children allowed the students to reconstruct their previous image of childhood, enriching some of their previous beliefs (e.g. low expectations) and leading to processes of theorisation of practice:

> *A: I thought they were going to pick less fruit… I loved the moment the kids would arrive and I would ask them "Do you want some fruit?", and they would be really happy.* (Case group observation, Phase 4).
>
> *A: I was struck by the fact that they took the plasticine and put it on the doll to measure its neck (…). They tell you they can't do it, but if you insist then in the end they will at least do something (…). A little girl was saying: I can't, I can't do it… So I took a piece of plasticine and I said: "Come on, let's make a ball". So I started to make a ball, and then the others made it, but by themselves.* (Class LS Group Observation, Phase 4).

Their direct experience with children helped them realise that pupils' needs and interests could only be known through being with them, inhabiting their spaces, and observing their actions and reactions:

> *E: To know the needs of a group, you have to be with them day by day. You have to be involved with them […].*
>
> *R: Go to the school and see them in their…*

S: Habitat! [they laugh].

R: . . .in their environment. (Case group observation, Phase 7).

It can be stated that the Experimental Lesson experience has allowed them to place more value on childhood, to believe in children's capabilities, to not have such preconceived, stereotyped ideas about pupils, and to understand the interactions between their potentialities and the developmental contexts in which they live, experimenting with new theories more in line with their pedagogical discourse.

(2) Evolution of the idea of the teaching role during LS

A primitive belief is identified among students in terms of their initial idea of the role of teacher, namely that it is the teachers who are with the children, disregarding the intellectual, moral and political character of their work:

A: So, what do we expect from children? Well, we hope they have a good time.

A: So let's look for fun activities. (Case group observation, Phase 2).

It is particularly worthy of note that the university students acting as teachers were perceived as over-elaborate in Experimental Lesson 1, with exaggerated positions and expressions, even browbeating the children in terms of questions and facilitation (observed in questions to pupils which they sometimes even answered themselves; behaviours involving supervision and close guidance; not letting pupils do things by themselves, etc.). This showed their interest, but also, as discussed earlier, their lack of confidence in them. Indeed, they were continually telling them what to do and asking them questions, which they often answered themselves, speaking, indicating, proposing, etc. They therefore expressed the roles of interventionist teacher and submissive pupil, which they used to justify limiting pupils' autonomy and creativity:

[One of the children is finishing his lion. Kenia passes him the things he has to put on the plate, and he places them on it. Then he says the ears are missing. Rocio moves the pieces he had used for the eyes around, and tells him "These are the ears, these are the eyes…"; Alicia takes two smaller pieces of banana, puts them in place and says "These are the eyes". The pupil, somewhat worriedly, asks whether the lion will move if he picks up the plate. The trainee teachers tell him not to worry, saying that they will fix it later.] (Case group observation, Phase 3).

However, in the second Experimental Lesson (EL2), involving an emergent spiral curriculum, some groups show changes in their vision of the teaching role, progressively letting the children flow and interact more freely with both the resources and their peers.

The teaching role therefore shifted towards a less interventionist model between the two sessions, and students started to believe more in the children's abilities while also suppressing their automatic urge to intervene and do things for them:

A: . . .in the second one [EL2] they were more receptive, because I would say to them "Come on, you can do it", "Come on, pick up the plasticine", and they did it, even though the first one was quite hard for them (. . .). So I liked being a teacher in the second one more than in the first one, because the children interacted more, cooperated more… in the second one they were more autonomous. (Case group observation, Phase 6).

Despite progressive awareness of this non-visible part of the teaching task (more active in the design and assessment of experiential contexts for the development of competencies, but less active in the moment of action with children), the university students still found it difficult to assimilate the idea of a teacher who observes and guides pupils' educational processes.

(3) Evolution in the practical design and development of the workshop training proposal

At first students focused their interest on compiling activities. Such activities included either material posted on the internet or spontaneous ideas from group brainstorming sessions, generally leaving to one side the goals or purposes that, as teachers, they had set out in Phase 1, based on the children's needs. This led to contradictions and feelings of distrust and a certain unease among the group. However, such unease (due to cognitive and social conflicts) subtly brought the need to reach useful agreements that would help them carry out the proposal.

Given the nature of the authentic tasks, the problems were therefore resolved in subsequent sessions as the group's real need to draft a comprehensive, detailed design became evident (even though they consciously failed to give this pre-action work the value it deserved):

> *E: We are going to have to clarify the rules, because there are going to be cases where they fight with each other. So we have to know how to act, we need to prepare ourselves before the session (. . .).* (Case group observation, Phase 2).

Ideas for experiential learning gradually emerged. At first they talked about plastic food, but slowly decided to switch to real food and a diversity of learning situations within this context:

> *E: What do you think about giving them food to handle?*
>
> *P: What types of plastic are we going to bring in?*
>
> *E: For instance, we could use a banana as food, and let them use their imagination, so it can be a trumpet, a recorder… see what I mean? Make them think about what they can be.*
>
> *R: And let's not forget curiosity…*
>
> *S: Curiosity is really to do with everything… Let them touch the food or do what they want… or maybe they don't want to touch it and prefer to simply smell it.*
>
> *E: Give them complete freedom to touch everything.* (Case group observation, Phase 2).

The sessions led to misgivings when it came to specifying concrete aspects of their action. In general, it seemed that they gave particular importance to improvisation as opposed to the rigour of a well thought out, well-designed proposal:

> *A: I think that this would be easier if, for example, we were (. . .) less fixated on what we are going to do when we are with the children (. . .)* (Case group observation, Phase 2).

The emotions they perceived during Experimental Lesson 1 (EL1) were of fear and uncertainty, from the insecurity of the first time they had an experience of this kind, through to confusion following the "chaos" they had gone through, which emerged even despite "having everything ready beforehand":

> *A: Let's see… we had the resources well prepared in advance, all in their little boxes, but when the children came it was a bit chaotic* (Case group observation, Phase 4).

This is proof that LS is a training strategy that takes students outside their comfort zones and allows them to start questioning their own practical knowledge, contrasting it with the cooperative experiences lived in authentic tasks.

Once Experimental Lesson 1 had been completed, it was time for self-evaluation and improvement before implementing Experimental Lesson 2 (see Figure 1). In this self-assessment, the case group participants did not observe major weaknesses in Experimental Lesson 1. Indeed, although they identified the need to change the spaces and include or remove materials, there were no proposals for significant changes from the initial proposal. These intense experiences and the internal and external contrasts that emerged brought conflicts in the group. For example, even when redesigning Experimental Lesson 2 – EL2 (Phase 4), as the class group discussed how they were going to receive the children and how

they would distribute them in the workshops, it could be seen how most of them continued to focus their interest on the teachers, followed by the workshops, rather than on the children. Nevertheless, some students, individually, did argue about organisation and prioritising attention to pupils, taking up a position based on previous experience:

> *Well, if I'm in the middle of a giant hug, I'm not going to say: Get off! But, since there are three teachers, maybe while I was finishing, they could take those who were arriving and starting.* (Class LS Observation Group, Phase 4).

All this gradually led them to show greater precision in organising the materials, in the communication context, in proposals for more flexible activities, in spatial organisation to attend to the children, etc., and, little by little, they became aware that the work of a teacher goes much further than simply that which is seen at the moment of action:

> *A1: I have learned that in the teaching profession there is a lot more work behind the activities than would appear at first sight.*
>
> *A2: Yes. At the beginning we were only looking for activities on one side and objectives on the other (…).* (Case group observation, Phase 6).

They were aware of the multiple factors that come into play when teaching, along with the importance of having security and confidence in working with children, something which, at least in part, comes from having clear goals underpinned by foundations that justify what is done and why ("having theory references that illuminate practice," as Esperanza said):

> *A: And I think that, had we not seen the process, which is everything, every theory, so to speak… if the kids had only come on that day without everything else behind us, I think it would have been different;*
>
> *R: We wouldn't have known what to do…;*
>
> *A: You don't know what you've done right or wrong. Because in some way the process makes you see what you have done with the objectives… you may achieve them or not. Then you can put your mistakes right.* (EF, Case group, 07/2019).

The trainee teachers undoubtedly found that the LS process induced them to plan ahead (both during and at the end), allowing them to give meaning to their educational practice, which also favoured motivation, effort, resistance in the face of difficulties, the search for ongoing training, etc.; in short, the need, to sustain themselves through cooperative work in the face of complex, ever-changing realities.

(4) Evolution in competencies for collaborative work

The degree of heterogeneity with respect to the overview of the project to be developed was particularly striking when observing the exchanges and dialogues that took place during the experience, and led to contrasting situations that allowed the communication process implicit in cooperative work to advance towards more specific actions:

> *R.: [We can ask them:] Do they give you a lot of homework?*
>
> *E: But it's not really useful for the activity, is it? We have to focus on the activity we want to programme, so what is the use of knowing that?* (Case group observation, Phase 1).

The first moments as a group were highly constructive. In the first working sessions the case group carried out a sustained, balanced participation between the different components. However, as the sessions progressed, it became apparent that the group was continually going back and forth in a cyclical manner. For example, well into the course (in session 10), it was clear that they still had a long way to go, since they understood it not as joint teamwork, but rather as group work, with a clear division of tasks that would conclude with the sum of

the individual parts, without giving an articulated overview. However, new questions were being provoked almost simultaneously among the group, which allowed its members to, thanks to their shared dialogue and improved group cohesion, express their errors, doubts and concerns, all within the framework of a progressive group understanding around the formative meaning of the LS proposal:

> *K: How are we going to act with the children to ensure they develop their workshop?*
>
> *E: Of course, but first we need to agree on the methodology, our teaching role, and so on; we need to clarify how we are going to act in the activity, and assessment will come from this (…) We can't go on like this [nervous laugh]. We have so many things to do that I don't know where to start.*
>
> *S: I'd start at the beginning. Otherwise we won't be able to… because we really are lost.* (Case group observation, Phase 2).

External observation of the groups shows that group participation becomes increasingly balanced, for example, when making decisions on practical matters such as deciding on the name of the workshop. However, this distribution of time and the assumption of individual responsibilities was much more uneven when they were focused on decisions of greater intellectual and critical or academic depth. Indeed, in these cases a certain inhibition was appreciated, with those students with a greater commitment to learning taking the initiative.

All this helped ensure that, however slowly, cooperative work was improving: common strengths were highlighted, shared doubts were questioned and mistakes learned from, and spaces were created to give visibility to those participants who were initially less present in the work dynamic. At the end of the project, the students' portfolios showed that they believed they had formed a solid group based around companionship, listening, empathy, and a helpful attitude in difficult situations, whether in academic or personal matters. Notwithstanding, they recognised that there was a need for greater involvement of group members, more consensus in decision-making, and more accountability for individual obligations:

> *Little by little, we advanced as a group, giving our opinions on each part of the work, so we were all involved in the different sections. We were finally a team.* (Paula's portfolio).

Students' practice throughout the LS gradually becomes apparent, along with their awareness (practical thinking) of the professional interdependence that takes place in cooperative groups, something that is essential in order to respond to highly complex educational contexts.

Discussion and conclusions

This educational experience has made it possible to demonstrate that LS is a training strategy which promotes, from an emergent spiral curriculum, the development of reflective habits in teachers, in accordance with García and Castro (2012), Korthaguen (2010), Perrenoud (2008), Marín and García (2016) and Soto (2016). Designing an Experimental Lesson within a real context has allowed students to transcend the academic field, coming out of their comfort zones and developing a will and predisposition to learn, i.e. what Pérez (1998) proposes as relevant learning, starting to break away from the synergies they had learned throughout their school years. Although the results and evidence, divided into four sections, are not particularly grandiloquent and may also show certain inconsistencies in the nature of the Experimental Lesson designed and developed by this group of six trainee teachers, the reflected process helps us to evince certain breaks from the established *habitus* (Bordieu, 2008), an intermediate territory between material structures and subjective patterns that constitutes the material and symbolic atmosphere surrounding the growth of every human being (Soto *et al.*, 2021). For this reason, beyond focusing on the degree of reconstruction or

coherence demonstrated by the trainee teachers, this study aims to reflect certain processes developed during the experience that represent the start of this qualitative leap in the ways of learning to be teachers. Here we refer to the fact that, although the dialogue between the prospective teachers was only superficial, more in-depth knowledge of both how preschool children learn and also of scientific theories and theories of education (remembering that they are in year one of their university education) is required, along with the need for awareness (theorisation of practice) of the importance of caring for the work process and group learning, and of designing rich contexts designed to develop competencies while also building towards professionalism. Another process generated by this experience among the trainee teachers is the way permanent reflection (theorisation of practice) is highly valued as a key aspect in terms of approaching and respecting childhood. Returning to the concept of *habitus,* these results show how generating this type of real experiences in the university can be key to mobilising, to some degree, the development of new reflective cooperative habits (experimentation of theory), which is unlikely to have occurred had they not developed an experience of this nature.

These limitations invite us to think about the institutional conditions of Spanish and European university systems (with four-month subjects that limit the time available and place constraints on experiences of this type), leading us to understand that more time would be necessary in order to plan, incorporate and accompany this type of innovative strategy (Wake *et al.*, 2013; Seleznyov, 2020), as well as greater coordination and connection between subjects in the curriculum (Seleznyov, 2020).

Further analysing personalised tutoring models as a fundamental part of the Lesson Study process in initial teacher training is proposed as a future line of research and action, as a way to ensure much more conscious, thorough tutoring and overcome the limitations and inconsistencies found in the group process developed and evinced in this experience.

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