



SUPPORTING PRIMARY SCHOOL TEACHERS' CURRICULUM LITERACY THROUGH PROFESSIONAL DEVELOPMENTⁱ

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Abstract:

This study designed, implemented, and evaluated a needs-informed professional development programme to support primary school teachers' curriculum literacy in Türkiye. A mixed-methods quasi-experimental design was employed. The quantitative component included 50 teachers in the experimental group and 62 teachers in the control group, with curriculum literacy perceptions and achievement measured at pre-test, post-test, and 16-week retention. The Curriculum Literacy Professional Development Programme (CLPDP) was implemented over four weeks in 10 sessions totalling 30 hours, combining 20 hours of synchronous online instruction with 10 hours of face-to-face practice. Post-intervention interviews were conducted with 10 participants, and a researcher diary provided supplementary qualitative data. Mixed-design ANOVA showed significant Group × Time interactions for both curriculum literacy perceptions and achievement. The experimental group improved from pre-test to post-test and maintained these gains at the 16-week retention measurement, whereas corresponding changes in the control group were not significant. Qualitative findings indicated greater awareness of the relationship between educational philosophy and curriculum, curriculum analysis and adaptation, and the value of linking theoretical input with collaborative practice. Overall, the findings suggest that needs-informed, blended professional development can support teachers' curriculum literacy knowledge, perceptions, and engagement with curriculum-related practices.

Keywords: curriculum literacy, curriculum knowledge, curriculum development, curriculum, professional development

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1. Introduction

Teachers rely heavily on curriculum materials, particularly textbooks, to plan lessons (Behar, 1994; Ben-Peretz, 1990). Although textbooks are concrete representations of the curriculum, they often reflect the authors' perspectives more than the curriculum's intentions (Venezky, 1992). Relying solely on them can limit teachers' pedagogical perspectives and stifle creativity by equating the textbook with the curriculum. Such overreliance may lead to standardised, repetitive instruction (Tulley & Farr, 1985). When teachers adhere rigidly to ready-made materials, they risk distancing themselves from curricular aims, weakening their understanding of relationships among components, and limiting their capacity to design meaningful learning experiences. Curriculum fidelity, therefore, should not imply mere compliance but a balance between adherence to aims and professional flexibility. Teachers who perceive the curriculum as a fixed script may fail to exercise professional judgement, overlook students' interests, and reduce their role to that of technicians implementing prescribed plans (Joseph, 2011). In contrast, teachers act as curriculum makers when they interpret, adapt, and contextualise curriculum frameworks to design responsive learning experiences (Deng, 2025; Marsh & Willis, 2007).

Recent work further emphasises teachers' roles as curriculum makers in knowledge-led and student-centred contexts. Early-career primary teachers, for example, report both enablers and constraints in curriculum-making, highlighting tensions between prescribed materials and professional judgement (Poulton & Mockler, 2024). Teachers' interpretations of the curriculum have been conceptualised as window into curriculum potential, revealing how these readings shape what becomes possible for students (Ross, 2024). Studies of macro curriculum-making show that when teachers participate in curriculum reform, they require robust curriculum literacy to translate policy into coherent, locally responsive curricula (Finnanger, 2025). This body of work points to the need for teachers to possess strong curriculum literacy to move beyond implementation towards informed curriculum-making. Curriculum literacy enables teachers to read curriculum documents critically, connect aims to content and assessment, and make principled decisions about when and how to depart from textbooks. In teacher preparation, curriculum literacy has been conceptualised as the capacity to navigate teacher identities, learner and community assets, and instructional materials (Marek *et al.*, 2025). This view aligns with frameworks that position teachers as critical consumers and adaptors of curriculum rather than passive deliverers (Education First, 2022; Schroeder & Curcio, 2022).

In Türkiye, the national curriculum adopts a student-centred approach. Curriculum-literate teachers are expected to implement it in line with its pedagogical foundations and to adapt it to classroom dynamics. Tran and O'Connor (2024) emphasise the importance of professional judgement in transforming curricular knowledge into practical learning experiences. In such contexts, curriculum literacy is not only about knowing the curriculum but also about turning curriculum documents into coherent,

locally meaningful opportunities for diverse learners. Sustained professional competence boosts teachers' confidence and agency. Teachers lacking ongoing professional development (PD) often struggle to link theory and practice (Freire, 1998). Despite increased focus on curriculum literacy, few PD programmes explicitly target primary teachers and aim to systematically integrate theory and practice. Many initiatives are short, centrally designed, and disconnected from classrooms, limiting understanding and application of the curriculum. There is concern that initial teacher education neglects curriculum literacy, creating a gap in teacher preparation (Steiner *et al.*, 2018). Enhancing curriculum literacy is vital for teachers' growth, pedagogical effectiveness, and autonomy. PD is a key process through which teachers' knowledge and beliefs develop, ultimately enhancing practice (Avalos, 2011). Opfer and Pedder (2011) conceptualise professional learning as an ongoing process shaped by experiences and school environments. Building on this, Deng (2018) argues that novice teachers have urgent needs regarding what and how to teach, which PD activities should address by fostering necessary knowledge and skills. Recent curriculum literacy PD work suggests that structured opportunities to critique, curate, and adapt instructional materials support curriculum literacy development, especially when combined with reflection and collaboration (Education First, 2022; Marek *et al.*, 2025; Schroeder & Curcio, 2022). Continuous, context-aware PD models, like the Curriculum Literacy Professional Development Programme (CLPDP) in this study, connect curriculum theory, policy, and practice.

This study was conducted in Türkiye to address this need. We investigated primary school teachers' PD needs in curriculum literacy by gathering insights from academics in Curriculum and Instruction (C&I), school principals, and teachers. Based on these insights, we designed, implemented, and evaluated the CLPDP. The programme aimed to strengthen teachers' ability to analyse, interpret, and apply the curriculum within a student-centred framework.

Previous studies mainly examined teachers' levels of curriculum literacy (Dilek, 2020; Kuyubaşoğlu, 2019; Şahin, 2020), their perceptions of curriculum literacy (Keskin, 2020; Yüceer Öztürk, 2019), or the implementation of curriculum literacy PD initiatives (Bilgin, 2023; Erdem, 2023; Yar-Yıldırım, 2018). Yet, limited evidence exists on how sustained, blended professional development can support the development of teachers' curriculum literacy and their capacity to interpret, analyse, and adapt curriculum in professional contexts. By addressing these questions, the study aims to fill the gap in understanding how teachers' curriculum literacy develops through PD. Unlike previous research, this study employed a blended learning model in which theoretical components were delivered via a remote platform, while practice-oriented activities were conducted face-to-face. Academics from the C&I field served as facilitators for the theoretical sessions, ensuring a strong link between theory and practice throughout the programme. Accordingly, this study aimed to design, implement, and evaluate a needs-informed professional development programme intended to enhance primary school teachers'

curriculum literacy. The programme was developed on the basis of a preliminary needs-assessment phase involving teachers, school principals, and academics in C&I.

The study addressed the following research questions:

- 1) Do changes in primary school teachers' curriculum literacy perception scores across the pre-test, post-test, and retention measurements differ between the experimental and control groups?
- 2) Do changes in primary school teachers' curriculum literacy achievement scores across the pre-test, post-test, and retention measurements differ between the experimental and control groups?
- 3) How do teachers who participated in the CLPDP evaluate their experiences with and the effectiveness of the programme?

2. Theoretical Framework

2.1 Curriculum Literacy

Curriculum literacy builds on teachers' knowledge of the curriculum and their ability to implement it. Shulman (1986) placed curriculum knowledge alongside subject matter, pedagogical content, and general pedagogical knowledge. Later studies noted it often receives less attention (Tomašević & Trivić, 2015). Practically, it involves understanding how materials like programmes, workbooks, and textbooks are organised for teaching, how topics are sequenced across year levels, and connected across subjects to ensure coherence (Shulman, 1986; Towers, 2012). Emphasising curriculum coherence and literacy requires a deep understanding of curriculum knowledge.

Ariav (1989) argued that limiting curriculum knowledge to the use of materials is too narrow and introduced the concept of curriculum literacy. This concept requires teachers to critically evaluate programmes, carefully select and adapt materials, and modify their choices to meet students' needs. Eisner (1979) described curriculum as the entire range of experiences provided by the school, emphasising that it is more than just a written plan. Therefore, teachers must interpret the curriculum and modify their planning to fit local conditions (Kaufmann *et al.*, 2002). Consequently, teachers should understand the curriculum and plan lessons in line with the school's context and their students' needs.

Teachers exercise control during enactment (Zais, 1976), often diverging from curriculum writers' intentions (Kirst & Walker, 1971). Initial training and support should build teachers' ability to critique, adapt, and implement curricula (Rudduck, 1987, as cited in Ben-Peretz, 1990). The curriculum is realised through classroom action and developed through teacher-student interaction (Marsh & Willis, 2007). Without these skills, teachers may depend on ready-made plans (Ünver & Erdamar, 2015). It is questionable for a teacher in a different school to implement another's plan verbatim, given different student needs.

Curriculum literacy is vital for interpreting materials (Ben-Peretz, 1990), yet poorly structured content can hinder teacher adaptation despite varied design rationales (Spiro

et al., 1987). Overcoming these barriers requires recognising teachers as curriculum makers (Barnes, 1982; Klein, 1989; Ornstein & Levine, 2008). Thus, curriculum literate teachers do not merely follow instructions; they analyse curricula against textbooks to develop effective, scientifically grounded lesson plans.

Recent scholarship refines curriculum literacy by emphasising teachers as critical consumers and adaptors of materials. The Curriculum Literacy Guide (Education First, 2022) defines it as the ability to recognise, select, revise, and use curriculum materials, with a focus on equity and learning opportunities. Schroeder and Curcio (2022) see “critical curriculum literacy” as teachers' ability to critique, curate, and adapt resources to ensure disciplinary rigour and meet students' needs. Marek *et al.* (2025) develop a framework where curriculum literacy involves navigating teacher identities, community assets, and instructional materials within policy contexts. These views depict curriculum literacy as a multidimensional skill set, highlighting the need for PD that addresses these areas in both initial and ongoing teacher training.

2.2 Professional Development

PD is a continuous, systematic process that enhances educators' knowledge, skills, and attitudes to improve student learning (Day, 1999; Guskey, 2000). It should be lifelong rather than episodic, given the dynamic nature of teaching (Guskey, 1995). Effective PD begins with a needs analysis, sets clear goals, aligns content, supports implementation, and includes feedback and evaluation (Carr & Harris, 2001; Guskey, 2000).

PD efforts often fall short due to barriers like top-down design, generic delivery, limited access, weak communication, and lack of systematic evaluation (Diaz-Maggioli, 2004). To address these, approaches should be context-sensitive, adult-learning oriented, transparent, and include practice and coaching. PD models vary in emphasis on individually guided, observation/assessment, involvement in a development/improvement process, training ve inquiry models (Sparks & Loucks-Horsley, 2003). No single model suits all; design must match local needs and resources (Guskey, 1995). Recent work views PD and initial prep as part of a golden thread supporting the teaching profession, emphasising continuity with preservice and in-service learning (Nuttall *et al.*, 2025).

Given the study's aims, a strengthened training model was adopted. The CLPDP was designed as a practice-oriented programme in which theoretical input was followed by collaborative tasks and structured feedback. These activities provided opportunities for teachers to examine curriculum documents, apply curriculum-development principles, and relate theoretical content to professional practice (Sparks & Loucks-Horsley, 2003). Academics in C&I facilitated theoretical input to ensure the connection between theory and practice. The design targets curriculum literacy, including understanding programme philosophy and structure, analysing vertical and horizontal alignment, interrogating and adapting materials, and planning for contextualised enactment.

This approach aligns with Korthagen's (2010) view that integrating theory and practice through reflection and contextualised learning is essential for meaningful teacher education. Day and Gu (2007) similarly emphasise that teachers' PD depends on organisational conditions that foster collaboration, autonomy, and emotional engagement. In this view, PD is a mechanism through which teachers become curriculum-literate professionals who maintain principled fidelity with informed flexibility, thereby exercising agency in everyday curriculum work.

2.3 The Context for the Study

The study was conducted in Türkiye during the 2022–2023 academic year. At the time of the study, curriculum literacy had already received explicit attention in national professional development materials, including the Ministry of National Education's teacher guide on curriculum literacy (Ministry of National Education [MoNE], 2022). This policy context provided additional relevance for professional development aimed at strengthening teachers' engagement with curriculum documents.

Within this context, the present study focused on developing a professional development programme that connected curriculum knowledge with opportunities for analysis, interpretation, and practice. The CLPDP was therefore designed on the basis of a needs-assessment process and implemented through a blended format combining theoretical input with practice-oriented activities.

Following the study's completion, curriculum reform in Türkiye continued with the publication of the Century of Türkiye Education Model in 2024 (MoNE, 2024). Although this reform did not inform the design or implementation of the CLPDP, its subsequent emphasis on curriculum-related teacher competencies further underscores the continuing relevance of curriculum literacy and professional learning.

2.4 CLPDP Development Process

The CLPDP was developed with reference to Taba's (1962) curriculum development model, which emphasises needs identification, objective formulation, content selection and organisation, the design of learning experiences, and evaluation. This framework was considered appropriate because the programme was explicitly grounded in an analysis of teachers' curriculum literacy needs. A process-oriented design was used to support active participation and learning through experience, while subject-centred elements were incorporated to organise the conceptual content of curriculum literacy.

The programme was also informed by the training model described by Sparks and Loucks-Horsley (2003), particularly its emphasis on structured learning, practice, feedback, and opportunities to apply newly acquired knowledge. In the CLPDP, theoretical sessions were followed by practice-oriented activities designed to connect curriculum theory with teachers' professional work. Participants worked collaboratively, examined curriculum documents, completed programme-development tasks, and received feedback during the process. The programme was organised into six modules,

with theoretical input and practical application distributed across the implementation period.

The needs-assessment process began with a review of the relevant literature and continued with semi-structured interviews conducted with eight academics specialising in C&I, four school principals, and 11 primary school teachers. Findings from the needs assessment were used to formulate the programme objectives and organise the content into modules. The objectives and proposed content were then subjected to expert review. Principles of sequence, continuity, integration, and balance were considered in organising content and learning experiences within and across modules.

The CLPDP was implemented over four weeks through 10 sessions, with a total duration of 30 hours. Of these, 20 hours were delivered synchronously online and 10 hours were conducted face-to-face. The six programme modules were distributed across the four-week implementation period. Theoretical content was primarily addressed during the online sessions, while the face-to-face sessions focused on collaborative practice, curriculum analysis, programme-development tasks, and feedback. This blended structure was intended to provide repeated opportunities for participants to engage with curriculum literacy concepts and apply them in practice. The resulting programme structure is presented in Table 1.

Table 1: Modules of the CLPDP

Module	Objective	Content
Module 1	1. Knows the concept of curriculum. 2. Defines the concepts of "objective, content, learning-teaching process, and assessment situation." 3. Knows the basic characteristics of educational philosophies. 4. Explains the educational philosophy adopted in each curriculum.	A. What is a curriculum? B. Relationship between the elements of the curriculum C. Curriculum and philosophy
Module 2	5. Explains curriculum design approaches. 6. Knows the steps to be followed in the curriculum development process. 7. Knows techniques for needs assessment.	D. Curriculum design approaches E. Curriculum development process F. The role of teaching in the curriculum development process G. Needs assessment study
Module 3	8. Knows the principles to be followed when determining objectives. 9. Classifies objectives according to their domains. 10. States objectives for a given topic/theme/unit.	H. Objectives - Cognitive domain - Affective domain - Psychomotor domain
Module 4	11. Lists the principles to be followed in content organisation. 12. Explains the strategies used in content organisation. 13. Explains the principles of organising the learning-teaching process. 14. Organises content for a given topic/theme.	I. Content J. Learning-teaching process

	15. Applies learning–teaching process principles in designing a topic/theme.	
Module 5	16. States the considerations in preparing assessment situations. 17. Designs assessment situations appropriate to the specified objectives.	K. Measurement and evaluation
Module 6	18. Designs a lesson plan.	L. Lesson plan design

Based on the content, activities were created for introduction, development, and conclusion, with a sample daily plan for each session. The blended teaching model combined online and face-to-face formats. Modules included both theory and practice, with specialists supporting theory and the researcher handling practical parts. Topics were scheduled weekly to enhance understanding of the relationships among curriculum elements. After weekly activities, teams designed lesson plans, examining and critiquing the relevant curriculum sections.

The CLPDP incorporated diagnostic, formative, and summative assessment and evaluation. As part of formative assessment, participants in the modules' practical sections engaged in group work. They were divided into teams and tasked with designing lesson plans for the topics covered in each module, using worksheets. These activities were designed to elicit higher-order objectives. The resulting products were evaluated using an analytic rubric. For diagnostic and summative evaluation, the Curriculum Literacy Perception Scale (CLPS), developed by Keskin (2020), and the Curriculum Literacy Achievement Test (CLAT), developed by the researcher, were administered to both the control and experimental groups. The scale and the achievement test were administered at three time points: a pre-test before the PD programme, a post-test after the programme, and a retention test 16 weeks after the post-test. The scores obtained were analysed, interpreted, and discussed both between and within groups.

3. Methodology

This study employed a mixed-methods quasi-experimental design that combined a pre-test, post-test, and retention-test control-group component with qualitative data collected before and after the intervention (Creswell & Creswell, 2018). The qualitative needs-analysis phase informed the development of the CLPDP, while post-intervention interviews and the researcher diary were used to explore participants' experiences and to contextualise the quantitative findings. Because participants were not randomly assigned to the experimental and control groups, the quantitative component was treated as quasi-experimental. Potential threats to internal validity in pre-test–post-test quasi-experimental designs include maturation, repeated testing, and the timing of measurements (Shadish *et al.*, 2002). Previous studies have used retention intervals of 12

weeks (Manoli *et al.*, 2016) and 15 weeks (O'Dwyer, 2013). In the present study, the retention measurement was administered 16 weeks after the post-test to examine whether observed changes were maintained over time. The overall study process is presented in Figure 1.

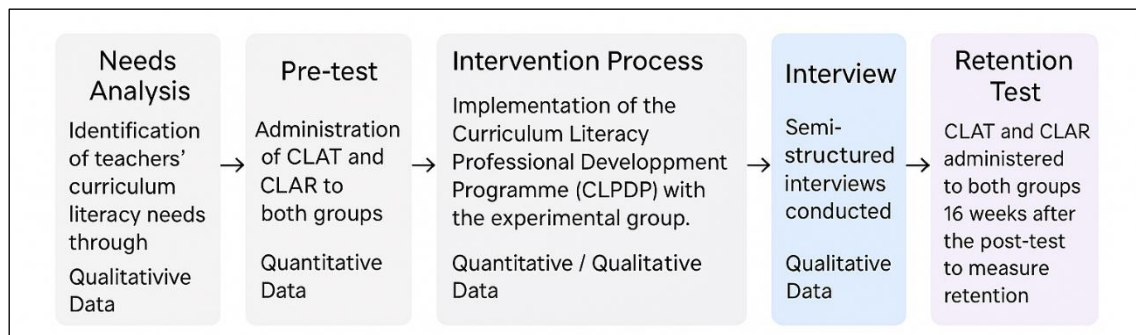


Figure 1: Overview of the study design and data-collection process

3.1 Design and Participants

The quantitative component included experimental and control groups, while the qualitative component involved a purposively selected subsample of participants from the experimental group. Participant characteristics and sampling procedures are described below.

3.1.1 Experimental Group

The experimental group comprised volunteer primary school teachers working in Balıkesir province during the 2022–2023 academic year. Participants were recruited through a programme announcement and purposive voluntary sampling. A total of 58 teachers applied and were accepted into the CLPDP. Complete data across the pre-test, post-test, and retention measurements were available for 50 participants, and the quantitative analyses were therefore conducted with these 50 teachers. The CLPDP was delivered in a blended format combining synchronous online and face-to-face sessions.

3.1.2 Qualitative Interview Subsample

Following the intervention, 10 participants from the experimental group were selected for semi-structured interviews using maximum variation sampling (Patton, 2015). Variation was sought in educational background and professional experience in order to capture a range of perspectives on the CLPDP. Participants had educational backgrounds including teacher-training institutes, bachelor's degrees, and master's degrees, and their teaching experience ranged from 12 to 43 years.

3.1.3 Control Group

The control group consisted of primary school teachers who did not participate in the CLPDP. Teachers were recruited through purposive voluntary sampling, with school location, educational background, academic qualification, and professional experience

considered during group formation. The final control group comprised 62 teachers. Detailed participant demographic information is presented in Table 2.

Table 2: Demographic characteristics of the experimental and control groups

Demographics	Sub-categories	Experimental n	Experimental %	Control n	Control %
School location	Urban	46	92%	51	82%
	District centre	0	0%	6	10%
	Rural area	4	8%	5	8%
Professional experience	0–10 years	4	8%	5	8%
	11–20 years	25	50%	14	23%
	21 years or more	21	42%	43	69%
Educational background	Associate degree	2	4%	3	5%
	Bachelor's degree	36	72%	50	81%
	Master's degree	12	24%	9	15%

3.1.4 Data Sources

The control group included primary school teachers not in the CLPDP, chosen for similarity to the experimental group based on school location, degree, qualifications, and experience, using purposive sampling and voluntary participation. Data sources included a reliable quantitative scale previously used in similar studies. The CLPS by Keskin (2020) has 38 items across four factors: understanding, implementing, valuing, and questioning the curriculum. A Confirmatory Factor Analysis (CFA) with data from 350 teachers who were not part of the main sample showed acceptable fit indices, confirming the model. Fit indices like $0 \leq (X^2/df) \leq 5$, $0 \leq RMSEA$, $SRMR \leq 0.08$, and $0.9 \leq CFI$, $NNFI \leq 1$ are generally considered acceptable (Hooper *et al.*, 2008).

The Curriculum Literacy Achievement Test (CLAT) was developed by the researcher to assess teachers' knowledge of the objectives addressed in the CLPDP. The test was administered to the experimental and control groups at pre-test, post-test, and retention measurement, with the retention test conducted 16 weeks after the post-test. Test development began with a review of the relevant literature and the findings of the needs analysis. A table of specifications was then prepared based on the programme objectives, and three items were initially developed for each objective. Following expert review, the preliminary test was administered to 120 primary school teachers who were not included in the main study. Item difficulty and discrimination indices were examined, and items that did not meet the predetermined criteria were removed or revised without compromising content coverage. The final CLAT consisted of 25 multiple-choice items.

The CLPDP objectives that could not be adequately assessed through the multiple-choice format of the CLAT were evaluated using the Curriculum Literacy Analytic Rubric (CLAR). During the practice-oriented components of the programme, participants completed collaborative worksheet tasks designed to elicit these higher-order competencies. A 10-item analytic rubric was developed to assess the resulting products. The rubric was reviewed by two academics specialising in C&I, and revisions were made in accordance with their feedback. The completed worksheets were subsequently scored by two raters using the CLAR. One rater was the researcher, and the second was a

doctoral candidate in C&I who had contributed to the implementation of the PD programme. The raters scored the products separately, and inter-rater agreement was examined using Cohen's kappa. The resulting coefficient was $\kappa = .49$, $p < .05$, indicating a moderate level of agreement according to Landis and Koch (1977).

To explore participants' views on the effectiveness of the CLPDP, the researchers developed a semi-structured interview form. The initial form, prepared through a review of the relevant literature, consisted of seven questions. Following expert feedback indicating a need for greater depth, additional open-ended and reflective questions were incorporated, bringing the total to 12. The revised form was reviewed by the same expert and an additional academic specialising in C&I. A pilot application was then conducted to assess the clarity and comprehensibility of the questions, and the final form was prepared based on the feedback obtained.

The researcher also maintained a reflective diary (Smith-Sullivan, 2008) throughout the intervention to record observations, reflections, emerging issues, and procedural details. The diary was used to document critical incidents and contextual information that might otherwise have been overlooked during implementation. Separate entries were prepared for each of the six modules, including both online and face-to-face sessions. These records were used as a supplementary qualitative data source during analysis and reporting.

3.2 Data Analysis

Quantitative data obtained from the CLPS and CLAT at pre-test, post-test, and retention measurement were analysed using mixed-design analysis of variance (ANOVA). Time (pre-test, post-test, and retention) was treated as the within-subjects factor, and group (experimental and control) as the between-subjects factor. Relevant assumptions were examined before interpreting the analyses. When the assumption of sphericity was violated, Greenhouse–Geisser corrections were applied. Significant Group $\times$ Time interactions were followed by Bonferroni-adjusted pairwise comparisons to examine changes across measurement occasions separately within the experimental and control groups. Partial eta squared (η^2) was reported as the effect-size estimate.

Products generated during the practice-oriented components of the CLPDP were evaluated using the CLAR. Two raters scored the completed worksheets separately, and Cohen's kappa was used to examine inter-rater agreement. Rubric scores were used descriptively to characterise participants' performance on the practice-based tasks.

For the qualitative analysis, interviews with 10 participants were audio-recorded and transcribed, yielding 3 hours and 10 minutes of audio and 98 pages of transcript data. Interview excerpts reported in this article were translated from Turkish into English by the authors. The researcher read the transcripts repeatedly and recorded initial analytic notes. An initial set of codes was generated and subsequently refined through further readings. Pattern coding was then used to group conceptually related codes, which were organised into sub-themes and broader themes. The researcher diary was used as a

supplementary qualitative source to contextualise and compare observations from the intervention with participants' interview accounts.

Quantitative and qualitative findings were integrated at the interpretation stage. The patterns identified in the CLPS and CLAT analyses were considered alongside participants' post-intervention accounts and the researcher diary to examine areas of convergence and complementarity. The qualitative findings were used to elaborate how participants experienced the programme and how they interpreted changes in their curriculum-related knowledge and perceptions; they were not treated as an independent test of the quantitative effects.

3.3 Credibility, Trustworthiness, and the Role of Researchers

Several procedures were undertaken to ensure the study's credibility and trustworthiness. To enhance internal validity, the time interval between the pre-test and post-test was carefully determined to prevent recall effects, and the retention measurement was administered 16 weeks later to examine whether the observed changes were maintained over time. The study initially included 58 teachers in the experimental group, of whom 50 provided complete data across all three measurement occasions.

For the qualitative component, credibility was supported by the researcher's sustained engagement with participants during both the online and face-to-face components of the CLPDP and by the use of multiple sources, including participant interviews and the researcher's diary. The coding framework and thematic structure were reviewed by a doctoral researcher and two professors specialising in C&I, and revisions were made in response to their feedback. Negative and critical participant views were retained in the analysis, including comments about the programme's limited duration, to represent both positive and less favourable experiences.

The researcher was directly involved in implementing the CLPDP, maintained the reflective diary, and served as one of the raters for the CLAR. This involvement provided close familiarity with the intervention context but also created the potential for researcher influence. Accordingly, the use of a second rater, expert review of the qualitative analysis, and the inclusion of critical participant accounts were used to support transparency in interpretation.

4. Results

4.1 Findings Regarding Perceptions of Curriculum Literacy

To address the first research question, a mixed-design ANOVA was conducted to examine whether changes in curriculum literacy perceptions across the pre-test, post-test, and retention measurements differed between the experimental and control groups. Descriptive statistics for the three measurement occasions are presented in Table 3, and the mixed-design ANOVA results are presented in Table 4.

Table 3: Descriptive statistics for curriculum literacy
perception scores across measurement occasions

Measurement	Group	n	M	SD
Pre-test	Experimental	50	4.04	0.50
	Control	62	3.89	0.35
Post-test	Experimental	50	4.60	0.35
	Control	62	3.81	0.32
Retention	Experimental	50	4.62	0.42
	Control	62	3.79	0.36

Preliminary analyses indicated that skewness and kurtosis values were within acceptable ranges across the three measurement occasions. Mauchly's test was non-significant, $W = .959$, $\chi^2(2) = 4.60$, $p = .101$, indicating that the assumption of sphericity was met. Levene's tests were non-significant for the post-test, $F(1, 110) = 0.85$, $p = .357$, and retention measurement, $F(1, 110) = 3.73$, $p = .056$, whereas the assumption of homogeneity of variance was slightly violated at the pre-test, $F(1, 110) = 4.02$, $p = .047$. Box's M test was significant (Box's $M = 38.06$, $p < .001$), indicating that the homogeneity of covariance matrices assumption was not fully met; therefore, the results were interpreted with appropriate caution.

Table 4: Mixed-design ANOVA results for curriculum literacy perception scores

Source	Sum of Squares	df	Mean Square	F	p	Partial η^2
Between-subjects						
Group	28.924	1	28.924	136.483	< .001	.554
Error	23.312	110	0.212			
Within-subjects						
Time (Measurement)	4.483	2	2.242	19.609	< .001	.151
Group $\times$ Time	8.060	2	4.030	35.254	< .001	.243
Error	25.150	220	0.114			

The mixed-design ANOVA revealed a significant Group $\times$ Time interaction, $F(2, 220) = 35.25$, $p < .001$, $\eta^2 = .243$, indicating that changes in curriculum literacy perceptions over time differed between the experimental and control groups. The main effects of time, $F(2, 220) = 19.61$, $p < .001$, $\eta^2 = .151$, and group, $F(1, 110) = 136.48$, $p < .001$, $\eta^2 = .554$, were also statistically significant.

Bonferroni-adjusted pairwise comparisons showed that, in the experimental group, curriculum literacy perception scores increased significantly from pre-test to post-test ($MD = 0.56$, $p < .001$) and from pre-test to the retention measurement ($MD = 0.59$, $p < .001$). No statistically significant difference was found between the post-test and retention scores ($MD = 0.02$, $p = 1.000$), indicating that the increase observed after the programme was maintained over the 16-week retention period. In the control group, none of the pairwise differences across the three measurement occasions were statistically significant (all adjusted $ps \geq .526$).

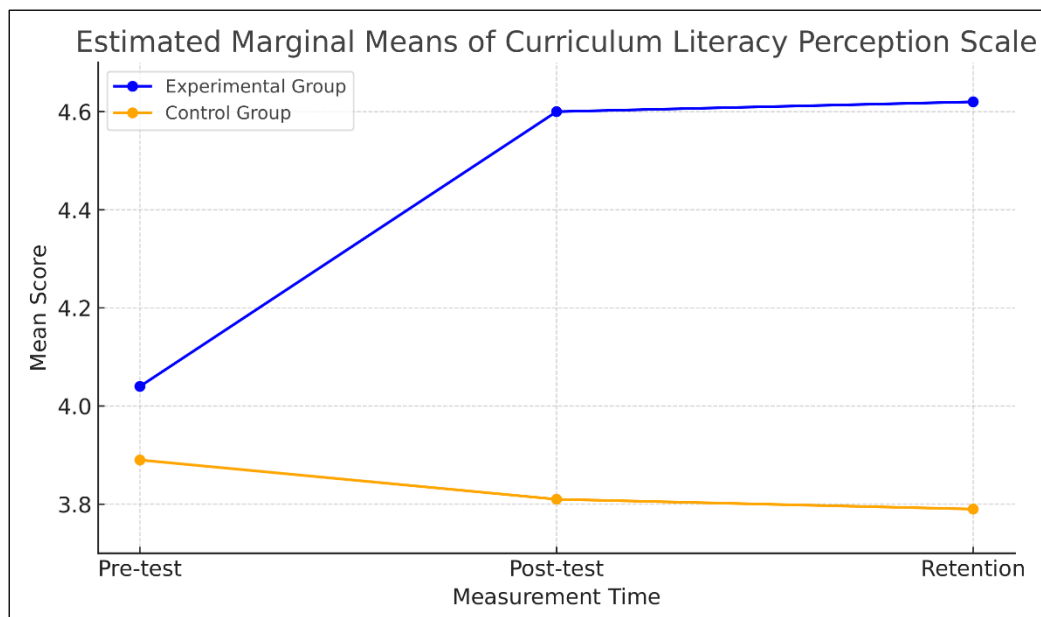


Figure 2: Changes in mean CLPS scores across measurement occasions

4.2 Findings Regarding Curriculum Literacy Achievement

To address the second research question, a mixed-design ANOVA was conducted to examine whether changes in curriculum literacy achievement across the pre-test, post-test, and retention measurements differed between the experimental and control groups. Descriptive statistics for the three measurement occasions are presented in Table 5, and the mixed-design ANOVA results are presented in Table 6.

Table 5: Descriptive statistics for curriculum literacy achievement scores across measurement occasions

Measurement	Group	N	M	SD
Pre-test	Experimental	50	17.00	2.69
	Control	62	16.29	3.48
Post-test	Experimental	50	20.90	3.09
	Control	62	15.79	3.64
Retention	Experimental	50	20.98	2.66
	Control	62	15.85	3.55

Mauchly's test indicated that the assumption of sphericity was violated, $W = .657$, $\chi^2(2) = 45.83$, $p < .001$. Therefore, Greenhouse–Geisser corrections were applied to the within-subjects effects ($\epsilon = .745$). The mixed-design ANOVA revealed a significant Group $\times$ Time interaction, $F(1.49, 163.81) = 35.13$, $p < .001$, $\eta^2 = .242$, indicating that changes in curriculum literacy achievement over time differed between the experimental and control groups. The main effect of time was also statistically significant, $F(1.49, 163.81) = 21.83$, $p < .001$, $\eta^2 = .166$. In addition, a significant main effect of group was observed, $F(1, 110) = 51.34$, $p < .001$, $\eta^2 = .318$.

Bonferroni-adjusted pairwise comparisons showed that, in the experimental group, curriculum literacy achievement scores increased significantly from pre-test to

post-test ($MD = 3.90$, $p < .001$) and from pre-test to the retention measurement ($MD = 3.98$, $p < .001$). No statistically significant difference was found between post-test and retention scores ($MD = 0.08$, $p = 1.000$), indicating that the improvement observed after the programme was maintained over the 16-week retention period. In the control group, none of the pairwise differences across the three measurement occasions were statistically significant (all adjusted $ps \geq .353$).

Table 6: Mixed-design ANOVA results for curriculum literacy achievement scores

Effect	df1	df2	F	p	Partial η^2
Group	1	110	51.34	< .001	.318
Time ¹	1.49	163.81	21.83	< .001	.166
Group $\times$ Time ¹	1.49	163.81	35.13	< .001	.242

Note: ¹Greenhouse–Geisser-adjusted degrees of freedom are reported because Mauchly's test indicated that the assumption of sphericity was violated ($\epsilon = .745$).

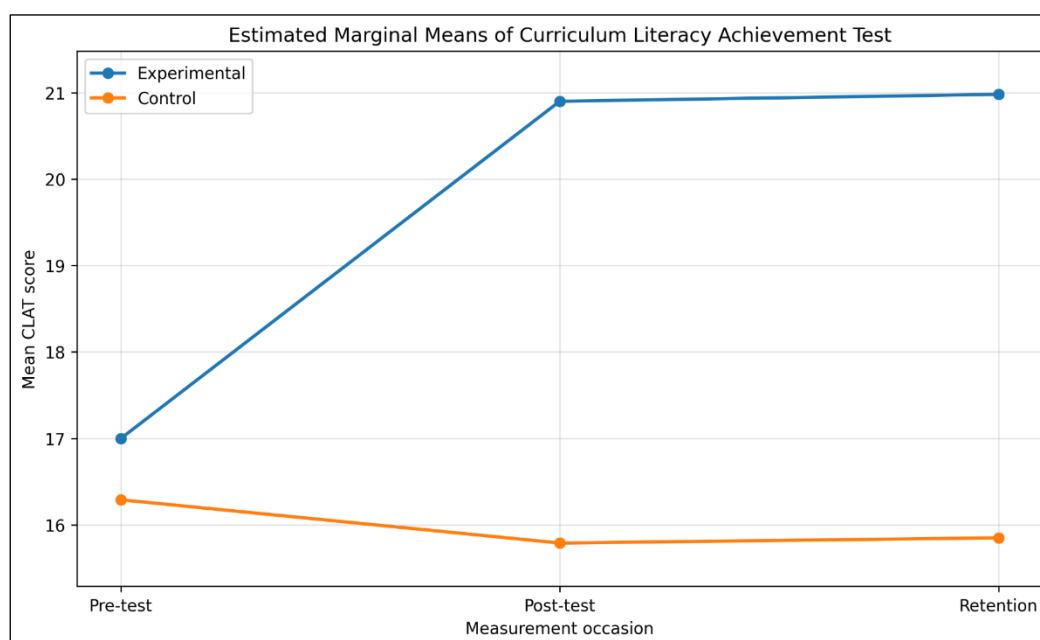


Figure 3: Changes in mean CLAT scores across measurement occasions

During the practice-oriented components of the CLPDP, participants worked collaboratively on curriculum-related worksheet tasks, and the resulting products were evaluated using the CLAR. Across the team products, total rubric scores ranged from 26 to 30. According to the rubric's predefined score ranges, all products fell within the Successful category (21–30). The scoring records also indicated comparatively lower performance on tasks involving the formulation of learning objectives and the design of assessment activities. These results were used descriptively to characterise participants' performance on the programme-based tasks and were not treated as an independent measure of classroom practice.

4.3 Qualitative Findings on Participants' Experiences and Evaluations of the CLPDP

To address the third research question, data from the post-intervention interviews and the researcher diary were analysed using qualitative content analysis. Initial codes were refined and grouped through pattern coding into conceptually related sub-themes and broader themes. The analysis yielded two main themes, five sub-themes, 26 codes, and three sub-codes, as shown in Figure 4.

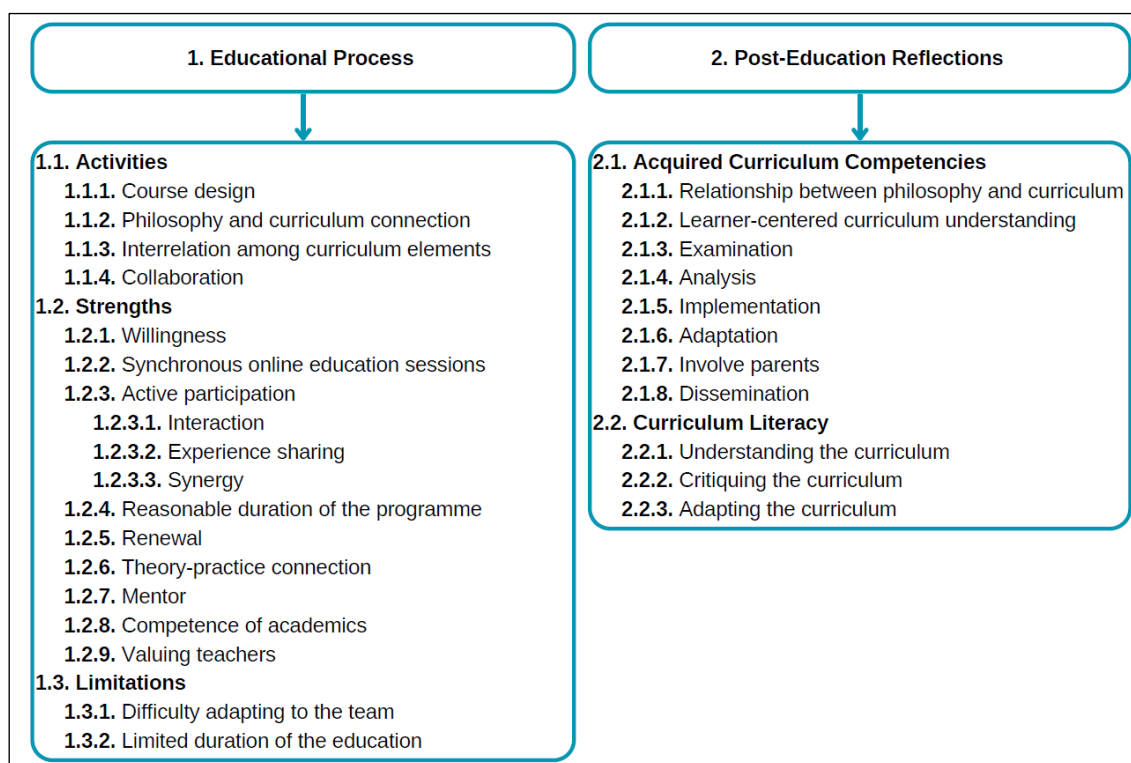


Figure 4: Themes, sub-themes, and codes identified in the post-intervention qualitative analysis

4.3.1 Educational Process

Within the scope of the Educational Process theme, participants' views on implementing the PD programme were explored. Participants shared their experiences with the instructional activities throughout the process. They also expressed satisfaction with their involvement in the programme and offered suggestions for improvement. Consequently, three sub-themes emerged under this main theme: activities, strengths, and limitations.

A. Activities

A blended approach was adopted in the PD programme, with theoretical components delivered online and practical sessions conducted face-to-face. Participants provided their views on the activities carried out during the process. Based on these views, the sub-theme **activities** included the following codes: *course design*, *philosophy and curriculum connection*, *interrelation among curriculum elements*, and *collaboration*. Participants reported that *course design* was practised as a central activity. Following the theoretical sessions, participants designed a curriculum step by step in teams. Participants described this experience as follows: “We actively experienced the curriculum writing process.” (P3); “First,

we identified a goal and formulated learning outcomes. Then, we decided how to present, teach, and assess them. Implementing it was valuable and prepared us for lesson delivery." (P4).

A notable aspect of the programme was teachers' recognition of the connection between educational philosophy and curriculum. In discussing the relationship between *code philosophy and curriculum*, participants reflected on philosophy in education. For example: *"Curricula are fundamentally grounded in educational philosophy. It is essential to understand this philosophical base before implementing any programme. This was one of the first things we discussed in the programme."* (P7).

Another frequently emphasised issue during education was the *interrelation among curriculum elements*. Participants shared their views on this point: *"Realising the relationship among curriculum elements was important for me. From now on, I will pay closer attention to how learning outcomes, teaching-learning processes, and assessment influence one another."* (P5) The programme was structured around *collaboration*. The theoretical knowledge was operationalised through collaborative activities. Participants expressed their experiences regarding collaboration as follows: *"After receiving the theoretical input, we engaged in group work to examine curriculum components and share our experiences with other teacher colleagues."* (P1); *"During face-to-face sessions, we split into teams of eight to ten, analysed curricula, chose an educational philosophy, formulated outcomes, developed content, and completed a curriculum design."* (P3).

The researcher also documented observations from the face-to-face sessions, especially regarding teamwork, as follows:

"Today, one of the teachers reported that it was their first time participating in this type of educational activity. They noted that, in typical in-service education, instructors read slides aloud. For the first time, they actively learned through group work after the theoretical sessions." (Diary 10).

B. Strengths

Under the sub-theme of **strengths**, the following codes emerged: *willingness, synchronous online education sessions, active participation, reasonable duration of the programme, renewal, theory-practice connection, mentor, competence of academics, and valuing teachers*. Participants expressed positive views regarding the PD programme. In this context, the relevant codes were organised under the sub-theme of strengths.

Participation in the PD programme was voluntary. The programme was announced, and primary school teachers who wanted to improve their curriculum literacy applied. The process was carried out with high participation. Participant opinions, which reflect their willingness, include: *"The week when the theoretical session was provided was particularly intense. Later, both theoretical and practical parts were combined. Participation was high in all sessions."* (P5); *"We realized that many of our peers had outdated or forgotten information, and we tried to complete this enthusiastically. We recognized our willingness."* (P3). The researcher was uncertain whether participants would attend the sessions. After the first session, this doubt was largely dispelled, and during a face-to-

face session, the researcher noted: *"It was pouring today, like last week during the applied session. Despite the rain, I was happy with the teachers' participation. They arrived right after school and actively engaged in the training, easing my fatigue and stress."* (Diary 5).

The PD programme was designed as a blended model combining online and face-to-face components. Academics delivered theoretical content through *synchronous online education sessions*. In this context, participants stated: *"We received theoretical sessions from professors in İzmir from the comfort of our homes. That made the training more enjoyable. We were not confined to a specific location."* (P5).

In addition to high participation and voluntariness, participants also emphasised *active participation* in the sessions. This was observed both in interactions with academics and among participants. Under the code of active participation, the sub-codes *interaction*, *experience sharing*, and *synergy* were included. Participants noted they could ask questions and express their thoughts during theoretical sessions, and that the classes were interactive. Example quotes include: *"We could ask questions that we were curious about. Our opinions were considered. I think that was very valuable."* (P8); *"We actively engaged with the screen, which was done pressure-free and with hints, preventing us from fearing to skip the next session due to knowledge gaps."* (P9).

The researcher observed mutual engagement: *"In this lesson, our professor related the content to alternative education. The participants were so impressed that they asked for a list of sources to learn more about the topic."* (Diary 5)

Teachers from different schools and regions met to become acquainted. During group activities, they shared their classroom practices. These thoughts were categorised under the sub-code of *experience sharing*. For example: *"Meeting teachers from different schools with varying socio-economic backgrounds helped us see where we stand. We shared experiences and gained various new ideas."* (P2). Supporting quotes include: *"This programme helped teachers share ideas and practices. Hearing about colleagues' methods encourages others to try them and exchange feedback on what works. That was helpful."* (P7).

With experience sharing and group harmony, *synergy* was achieved. Participants reported benefiting from teamwork during the activities. Example quotes include: *"The PD programme was very effective and well-designed. Especially working in teams and reaching a consensus through diverse opinions made it impactful."* (P3). The researcher reflected on participants' active involvement in online sessions:

"Participants' active participation, particularly in online sessions where they shared their views with the academics, fostered a positive environment. Despite being tired after school and joining the sessions around dinnertime, their engagement showed they genuinely valued this training. The instructors were also motivated and sincerely shared their thoughts upon seeing such enthusiastic teachers." (Diary 6)

Another important point raised by the participants was the *reasonable duration of the education*. They stated that the extended timeline distinguished it from conventional in-service education. Relevant quotes include: *"It was a four-to-five-week programme, which*

is relatively long compared to typical PD programmes. The extended timeline was appreciated." (P6); *"It was a different experience for me. Unlike other programmes that end in a week, this one included both theory and practice and covered different topics each week, which enhanced retention."* (P3).

Teachers emphasised that the programme helped them refresh their knowledge of the curriculum. They expressed the benefit of recalling information from their undergraduate education. For example: *"This PD programme first allowed us to refresh the information we received during our undergraduate studies."* (P3); *"Remembering our knowledge was important. We took curriculum courses, but that was 28 years ago. Although the content is similar, refreshing that knowledge was crucial."* (P6).

The connection between theory and practice greatly enhanced the programme's effectiveness. Participants shared their thoughts on practicing after theoretical lessons: *"The fact that this education included practical applications was very beneficial for us. Applying what the instructors taught reinforced our learning."* (P9); *"Looking back, I used to think I knew nothing. But through our discussions with academics and the opportunity to practice what we learned, this programme provided valuable contributions."* (P4).

One of the programme's strengths is the involvement of mentor academics. These academics served as instructors, enabling participants to acquire theoretical knowledge from experts and to ask questions. Quotes include: *"Different academics provided us with insights, which broadened our perspectives. That was the strength of the programme."* (P5); *"There were various valuable professors both online and in-person. We gained knowledge from them, which I think was beneficial for us."* (P7).

Participants also reflected on the competency of academics: *"It is disappointing when education lacks competence, but I did not encounter that here. Everything was planned, and the academics were well-prepared."* (P7); *"I was pleased that the professors were experts in their fields from İzmir. In the past, in-service education instructors would read from slides. Here, they were knowledgeable and interactive. That was very valuable to me."* (P8).

One particularly notable point was the value academics placed on teachers' opinions. This was recorded under the subcode for *valuing teachers*. Example quotes include: *"It was nice that our ideas were valued, that they listened to us and offered suggestions."* (P2); *"The instructors were very sincere. They made us feel valued. Although we do not usually experience that, having trainers who understood and appreciated us was significant. We felt happy and honoured."* (P4).

C. Limitations

Although the PD programme process has strengths, various challenges may also arise. Recognising these challenges can help improve future implementations by avoiding similar mistakes. Under the sub-theme of limitations, two codes were identified: difficulty adapting to the team and limited educational duration. While some participants highlighted the benefits of teamwork in education, others noted its drawbacks. These views, categorised under the code difficulty of adapting to the team, suggest that

individual work might be more effective. Relevant statements include: *"Instead of group work, we could have completed tasks individually and given our presentations."* (P10).

The PD programme can be viewed as an introduction to curriculum literacy or as a means of recalling prior knowledge. The content delivered in each session was comprehensive and could be expanded further. Although the allocated time was sufficient to maintain consistent teacher engagement, participants expressed satisfaction with the training and highlighted its brevity. For example: *"The education lasted for four or five weeks. Honestly, I did not find it sufficient. I believe this is an area that needs to be extended over a longer period."* (P8); *"I believe this area needs to be spread out over a longer duration. Additionally, perhaps the richness of your presentations left us wanting more. I wished it had lasted longer."* (P5). Regarding the programme duration, the researcher noted the following in their diary:

"Today, we finished our final face-to-face session. Teachers supported continuing these meetings and appreciated the atmosphere. They noted that seeing others think critically and create boosts their hope. So, we decided to keep the WhatsApp group open for ongoing sharing." (Diary 12).

4.3.2 Post-Education Reflections

In interviews on the effectiveness of curriculum literacy, participants discussed the post-educational phase. In the interviews on the effectiveness of the programme, participants also reflected on the period after the training, describing the curriculum competencies they had acquired and how their understanding of curriculum literacy had changed. Within this theme, two sub-themes emerged: **acquired curriculum competencies** and **curriculum literacy**.

A. Acquired Curriculum Competencies

The subtheme of acquired curriculum competencies comprises the following codes: *the relationship between philosophy and curriculum; learner-centred curriculum understanding; examination; analysis; implementation; adaptation; involvement of parents; and dissemination*. After the programme, teachers reported a change in their perception of the curriculum. They stated that they became more aware of the curriculum and intended to implement these insights in their classrooms. It was emphasised that effective curriculum implementation requires both curriculum knowledge and lesson-planning skills.

Participants reported a better understanding of the *relationship between philosophy and curriculum*. They indicated that applying a curriculum without aligning with its underlying philosophy would be ineffective. Illustrative comments include: *"I will ensure alignment with the philosophy of the curriculum."* (P4); *"While anyone may understand progressivist philosophy, a teacher must develop their own understanding first to effectively educate the next generation accordingly. Otherwise, the curriculum stays theoretical."* (P8).

Educational philosophies shape curricula. A teacher saying, *"'Be quiet, sit down!' is influenced by essentialism. Conversely, those who act as guides and collaborate with students are influenced by progressivist philosophy. This programme helped me understand that."* (P3).

Participants recognised the programme's focus on philosophy and stated that the curricula were student-centred. Consequently, they proposed implementing a learner-centred curriculum. For example: *"From now on, I will prioritise content appropriate for students' levels and involve them more in the process."* (P7).

Several participants stated that, prior to the programme, they had not examined the curriculum. Afterwards, they emphasised the importance of reviewing it, especially at the beginning of the academic year: *"From now on, I will start by reviewing the curriculum"* (P7); *"We need to examine the curriculum at the beginning of the school year"* (P6).

Some participants went beyond examination, emphasising the importance of critically analysing the curriculum: *"After this programme, our perspective on the curriculum changed. We learned how to evaluate it critically"* (P2). They explained how they had learned to conduct in-depth analyses and to apply that skill in practice. *"In a final session, you presented a revised life sciences curriculum objective on disaster awareness. Usually, such drafts are optional, and I haven't heard anyone say, 'I reviewed it, and here are the changes.' You showed us it wasn't hard, helping us realize the need for critical analysis. I will continue this during in-service periods."* (P9).

Some participants stressed that they would begin actively implementing the curriculum itself, rather than relying solely on textbooks or pre-prepared annual plans: *"From now on, I have committed to following the curriculum. I did not care much before"* (P10); *"I realized how necessary it is to consult the curriculum and use it throughout the process"* (P6). Another key outcome reported by participants was the ability to adapt the curriculum to their teaching context: *"Now I have learned that I can modify any curriculum according to time, order, and the needs of my students."* (P9); *"We have learned to develop culturally and contextually appropriate activities for our students. We can now adapt the curriculum to suit students' levels."* (P2).

The importance of school–parent collaboration was also emphasised during the programme. Participants shared their intentions to involve parents in the curriculum: *"At the first parent meeting, I plan to share key aspects of the curriculum and explain how they can contribute."* (P10); *"In the third-grade curriculum, I intend to share learning objectives and methods during the first and, if necessary, a second meeting with parents."* (P8).

Participants also highlighted the need to scale the programme to broader audiences under the dissemination code: *"It would be great if this could be repeated with different groups, in various schools, and with a wider reach to include all teachers."* (P7); *"Offering this curriculum literacy PD programme periodically, either at the provincial or district level, or transforming it into an official in-service programme, could help overcome limitations."* (P5).

B. Curriculum Literacy

The curriculum literacy sub-theme includes the codes: *understanding the curriculum*, *critiquing the curriculum*, and *adapting the curriculum*. After the programme, participants were asked to define curriculum literacy. They reported increased awareness and a more informed perspective. For some, curriculum literacy meant possessing and applying deep knowledge of the curriculum: “After the programme, curriculum literacy meant to me: having curriculum knowledge, being able to interpret it, and transferring it accurately into the learning environment.” (P3); “Curriculum literacy no longer just means reading the curriculum—it means understanding its focal points and knowing how to manage the teaching process accordingly.” (P2); “It is a term we have always heard, but now we understand it better: being aware of the curriculum, interpreting its elements, and translating them into effective planning and instruction.” (P1). Teachers who emphasised the importance of identifying the curriculum’s strengths and weaknesses framed their views under *critiquing the curriculum* code: “Looking at both the curriculum and our practice, I can now see the mistakes we have been making. I believe I can now evaluate both more consciously.” (P4).

Another essential element of curriculum literacy was *adaptation*. Participants emphasized that curriculum-literate teachers should not rely on pre-made annual plans but instead tailor their planning to local contexts: “For me, curriculum literacy now means not downloading ready-made plans but adapting them to my students and my teaching environment.” (P10); “A curriculum-literate teacher is not just an implementer but also an adapter who adjusts the curriculum to specific conditions.” (P6).

5. Discussion

The CLPDP was developed based on a needs assessment involving primary school teachers, school principals, and academics in C&I, and was implemented through a blended format that combined theoretical input with practice-oriented activities. The blended PD model combined online theory with face-to-face practice, fostering collaboration and allowing the application of theory in realistic contexts. This supports Tran and O’Connor’s (2024) view that engaging with curriculum materials helps reshape understanding and aligns with research on collaborative curriculum-making (Poulton & Mockler, 2024; Ross, 2024; van Bommel *et al.*, 2025).

Quantitative analyses showed significant Group $\times$ Time interactions for both the CLAT and CLPS, with the experimental group increasing from pre-test to post-test and maintaining these gains at the retention measurement. Follow-up comparisons showed significant increases from pre-test to post-test and from pre-test to retention in the experimental group, with no significant difference between post-test and retention; corresponding changes in the control group were not statistically significant. Teachers reported a better understanding of the relationship between educational philosophy and curriculum, deeper insights into the components of the curriculum and their relationships, and greater confidence in adjusting curricular elements to local classroom conditions. They also developed sample curricula during the programme, providing

evidence of their ability to apply curriculum-literacy knowledge within programme-based tasks (Ross, 2024).

When the quantitative and qualitative findings are considered together, a broadly convergent pattern emerges. The increases in CLPS and CLAT scores in the experimental group were accompanied by participants' reports of greater awareness of curriculum components, educational philosophy, curriculum analysis, and adaptation. The qualitative findings also help contextualise the quantitative changes by identifying programme features that participants perceived as useful, particularly the combination of theoretical input, practice-oriented activities, collaboration, and access to academic expertise. At the same time, these accounts should be interpreted as participants' perceptions of the programme rather than as independent evidence that the intervention caused changes in classroom practice.

Participants noted strengths like high voluntary participation, active online engagement, and combining theory with practice. Expert involvement was seen as valuable, as teachers appreciate guidance (Eraut *et al.*, 1975). However, the value of such involvement is likely to depend on the experts' attitudes and the quality of interaction.

The findings further highlight the importance of linking theory and practice in professional development. Participants valued the practical training, reporting it enhanced their learning—consistent with Choppin (2011) and Zaragoza *et al.* (2023). This aligns with Van Driel and Berry (2012), who say effective PD must combine pedagogical content knowledge with curriculum understanding for sustainable change. Team-based collaboration increased motivation, but participants noted the short training duration. Eraut *et al.* (1975) and Sinnema and Stoll (2020) suggest collaborative environments enrich curricular experiences, but time is essential. These processes reflect Avalos's (2011) view that collegial dialogue and shared reflection are crucial for teacher learning.

Analysis of curriculum competencies showed that the programme's design reflected constructivist and progressivist educational philosophies. Teachers became more aware of student-centred approaches and critically reflected on both the curriculum's underlying philosophy and their own beliefs. Participants' accounts suggest that the programme helped bring their values closer to curricular intent. Phillips (2009) noted that while some teachers view change as the adoption of new materials, others undergo deeper pedagogical transformation—a distinction also evident in this study.

Following the programme, teachers reported intending to rely more on the curriculum than on secondary resources such as textbooks or ready-made plans, supporting Bakken and Andersson-Bakken's (2021) view that textbooks cannot replace professional judgement or the curriculum. Participants also described intentions to consult, analyse, and adapt curriculum documents more deliberately in their future practice. These accounts should be interpreted as reported intentions rather than as observed changes in classroom enactment. Overall, the findings suggest that the CLPDP supported teachers' curriculum literacy and encouraged more reflective and collaborative engagement with curriculum-related practices.

6. Conclusion

This study found that participation in the CLPDP was associated with improvements in teachers' curriculum literacy knowledge and perceptions, with gains maintained at the 16-week retention measurement. The findings suggest that the programme's needs-informed design, structured implementation, expert involvement, and integration of theory and practice may have contributed to these outcomes.

Participants saw curriculum literacy as the ability to understand, critically evaluate, and adapt the curriculum to context. Curriculum-literate teachers interpret documents, examine textbooks and guides critically, and adapt them for students and school conditions. These findings align with research on teachers' complex interactions with curriculum materials affecting student learning (Remillard & Bryans, 2004; Stein *et al.*, 2007), and frameworks viewing curriculum literacy as managing teacher identities, learner assets, and materials (Education First, 2022; Marek *et al.*, 2025; Schroeder & Curcio, 2022). PD can help teachers refresh their knowledge, keep up to date, and reflect on their practice. In-service PD helps refresh knowledge, stay current, and foster reflection. Ongoing PD should be regarded as a long-term focus, ensuring sustained preparation across a teacher's career (Nuttall *et al.*, 2025).

Future research could broaden curriculum literacy PD models to include teachers across grade levels, subject areas, principals, and curriculum developers. A school-based model could foster ongoing, collaborative learning and support teachers' roles as micro- and macro-curriculum makers (Finnanger, 2025). Opfer and Pedder (2011) suggest that teacher learning is continuous and context-dependent and thrives in systems that institutionalise reflection, feedback, and collaboration. Embedding curriculum literacy in such systems may promote more coherent, equitable, and responsive curriculum enactment.

6.1 Study Limitations

Several limitations should be considered when interpreting the findings.

First, participants were not randomly assigned to the experimental and control groups. The experimental group consisted of teachers who voluntarily applied to participate in the CLPDP, which introduces the possibility of self-selection bias and limits causal inference. In addition, some demographic differences remained between the groups, particularly in professional experience. The study was conducted with primary school teachers from a single province in Türkiye; therefore, the findings should not be generalised directly to teachers working in different geographical, institutional, or educational contexts.

Second, although 58 teachers initially participated in the experimental group, complete data across the three measurement occasions were available for 50 participants. This attrition should be considered when interpreting the quantitative findings. The use of the same measures at pre-test, post-test, and retention may also have introduced some

repeated-testing effects, although the 16-week retention interval reduced the likelihood of immediate recall.

Third, the study combined achievement, perception, practice-based, interview, and researcher-diary data, but changes in teachers' actual classroom enactment were not directly observed. Consequently, participants' statements concerning future curriculum use, adaptation, and classroom practice should be interpreted as reported perceptions and intentions rather than verified changes in classroom behaviour. Student-level outcomes were also beyond the scope of the study.

Finally, the researcher was directly involved in implementing the CLPDP, maintained the reflective diary, and served as one of the raters of the practice-based products. Although a second rater and external expert review were used to strengthen the credibility of the analysis, researcher involvement may still have influenced data generation and interpretation. These limitations indicate the need for future studies using randomised or more closely matched groups, multiple implementation sites, direct classroom observations, and student-level measures.

Ethics Approval

Ethical approval for the study was obtained from the Ege University Social and Humanities Scientific Research and Publication Ethics Committee (Protocol No. 1554; Meeting/Decision No. 07/07; Date: 27 July 2022). The study was unanimously approved as ethically appropriate.

Data Availability

Data will be made available on request.

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