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Toward Sustainable Teacher Education: Pre-Practicum Learning Approaches of Second-Year Early Childhood Education Students

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Abstract

Student approaches to learning are a key factor in determining learning outcomes in higher education, particularly in teacher education programmes where the development of reflective and autonomous professionals is essential. This study examines second-year Early Childhood Education students' self-perceptions of their learning approaches prior to the practicum. Data were collected from 311 students across three Catalan universities using the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F). A quantitative design was employed using a self-report questionnaire to analyse the relationship between motivation, learning strategies, and students' tendency towards deep or surface learning approaches. The findings reveal variability in motivation and strategy use, with a tendency towards less consolidated deep learning approaches at this stage of training. Differences associated with students' profiles, particularly age and academic pathways, were also observed, although these should be interpreted with caution. The study identifies key pedagogical factors that may support the development of deeper learning, including the design of practicum seminars that promote reflection, meaningful engagement, and alignment between theory and practice. These results suggest that structured pedagogical approaches, such as constructive alignment, can contribute to fostering reflective, autonomous, and professionally oriented learning in teacher education. By linking students' learning profiles with curriculum and assessment design, this research contributes to current debates on sustainable teacher education and offers evidence-based guidance for strengthening practicum structures aligned with Education for Sustainable Development and Sustainable Development Goal 4.



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1. Introduction

University students' learning approaches are conditioned by various factors, such as motivation and teaching methods, which spearhead the creation of specific learning strategies (Pintrich, 2003; Shaikh et al., 2017).

The question asked before carrying out this research was the following: “How do second-year students pursuing a degree in early childhood education (ECE) perceive their learning process before starting the teaching practicum?” A superficial approach to learning is clearly in contradiction with the goals and principles of what university education should be (Bunce et al., 2017). Competency-based learning (CBL) should foster students’ abilities to learn through a deep, student-centred approach that prioritises reflection (Bächtold et al., 2022) and thinking skills (Alt et al., 2023).

According to Biggs (2014), teaching is designed to engage students in learning activities that optimise their chances of achieving what they need to learn (outcomes), and small group practice seminars provide an ideal context to facilitate this engagement. Some studies have addressed the Bologna requirements for CBL with the help of constructive alignment (CA) (Lueg et al., 2015; Cheng et al., 2024), and the results of these studies indicate that both CBL approaches and education coincide on the goal of optimising students’ learning experiences through motivated strategies and well-aligned instructional practices. Understanding learning processes improves the adaptability of teaching and learning outcomes (Marton et al., 1997; Mallillin, 2022).

Within the framework of Education for Sustainable Development (ESD) and digitalization, teacher education is increasingly expected to promote not only disciplinary knowledge but also reflective capacity, adaptability, and lifelong learning competences (Geertshuis et al., 2022; Yang et al., 2024). Sustainable teacher education involves creating learning environments that support deep learning, intrinsic motivation, and coherence between learning outcomes, teaching activities, and assessment practices. In this sense, practicum seminars represent a privileged space to operationalise pedagogical sustainability, as they connect academic knowledge with professional practice through guided reflection and constructive alignment.

In this context, sustainable teacher education can be understood as the capacity to design learning environments that promote long-term, transferable competences. Deep learning approaches and constructive alignment play a key role in this process, as they support meaningful, reflective, and coherent learning experiences that extend beyond immediate academic outcomes.

The following sections first examine the theoretical foundations of students’ learning approaches and their relevance to initial teacher training, with particular attention to the role of practicum seminars in fostering sustainable professional development.

1.1. Learning Approaches in Higher Education

Current student approaches to learning (SAL) postulate that learning outcomes depend on the approaches students use. Currently, there are two main orientations regarding SAL that have been identified in a wide range of studies and contexts: the deep approach (DA) oriented towards the search for meaning, and the surface approach (SA) oriented towards reproduction (Hernández Pina et al., 2002). The first authors to use the terms “deep approach” and “surface approach” to learning were Marton and Säljö (Hernández Pina et al., 2002), following research they conducted with the aim of knowing students’ levels of understanding.

According to the authors mentioned in the previous paragraph, a surface approach is aligned with low learning outcomes and a quantitative conception of learning that seeks results without too much effort. It involves the accumulation of knowledge, memorisation, reproduction, and application without planning. A deep approach generates understanding, contextual adaptation, and implies personal change that promotes the development of thinking skills and the application of interest-based strategies used to improve understanding (Hernández-Pina, 1996; Marton et al., 1997).

Learning approaches depend on two sub-factors: students' motivations and the thinking strategies used in the learning process (Biggs & Tang, 2022; Pintrich, 2003; Shaikh et al., 2017). Motivations are the intentions that move people, in this case students, to perform certain extrinsic or intrinsic actions (Balyer & Özcan, 2014; García-Pérez et al., 2020; Weiner, 2000). Intrinsic motivation arises from personal interest and engagement in subjects, understanding and meaningful learning, and is correlated with a deep learning approach (Entwistle & Ramsden, 2015; Orazbayeva et al., 2019; Bächtold et al., 2024). Extrinsic motivation is linked to surface learning and is driven by external factors that basically seek to satisfy demand (Amabile, 2018).

A strategy is an orderly and conscious succession of actions directed towards a goal. When this goal is learning, we speak of learning strategies or observable sequences of thought processes that have the appropriation and construction of new knowledge as their ultimate goal. As they are intentional and conscious, strategies always presuppose decision-making. Self-regulation processes and strategy development facilitate a deep learning approach (Wilson & Fowler, 2005; Schunk & Zimmerman, 2012), which produces learning outcomes that are superior to those of the SA (Ramsden, 2003). Learning strategies based on the DA help students to better understand, retain, and remember information. They also encourage study habits that facilitate turning information into meaningful knowledge.

A strategic student does not reproduce the techniques the teacher proposes, but decides to use them, based on reflection and conscious analysis, to achieve the objective set. This enables students to regulate their actions and make decisions.

According to Nisbet and Shuckersmith (Nisbet et al., 1987), learning strategies are executive processes through which thinking skills are chosen, coordinated, and applied.

In this study, thinking skills are understood as higher-order cognitive processes that enable students to analyse, interpret, evaluate, and apply knowledge in meaningful ways. Drawing on the generic competences framework (Villa & Poblete, 2008), these include analytical, critical, reflective, and creative thinking, which are closely related to the development of deep learning approaches.

Although different taxonomies exist, common elements across the literature include open-mindedness, intellectual curiosity, and reflective judgement (Sosu, 2013). In higher education, critical thinking (Fisher, 2014) often associated with analytical and rational processing (Evans & Stanovich, 2013; Kahneman, 2011) is considered a core learning outcome (Bellaera et al., 2021; Bravo et al., 2020).

These thinking skills are essential for promoting meaningful learning, as they allow students to move beyond surface-level engagement and develop deeper understanding through the integration, reflection, and application of knowledge. In this sense, CBL fosters students' abilities to learn through deep learning, prioritising reflection and the development of thinking skills (Bächtold et al., 2022; Alt et al., 2023).

Understanding students' learning approaches before the practicum is relevant because these approaches influence how they engage with reflection, feedback, and professional learning in practicum seminar settings.

1.2. Early Childhood Education Teachers' Initial Training and Practicum as a Training

ECE is the first educational stage and one of the most important stages in the educational system. In Catalonia, this stage covers children from 0 to 6 years old and is organised into two cycles: first cycle (from 0 to 3 years old), and second cycle (from 3 to 6 years old). Early childhood care and education (ECCE) is a fundamental part of the education system (UNESCO, 2023), and the role of teachers is crucial (Tashkent Declaration, UNESCO, 2022).

To ensure quality educational training (SDG 4), teaching competence and the construction of teacher identity must be part of professional performance based on teaching

practicums in initial teacher training. There must be a relationship between this training and the promotion of skills and motivations that allow deep learning in future teachers (Molina-García et al., 2024).

Teaching practicums are considered the backbone of the education degree and practicum seminars are the ideal space for reflection. According to these authors, it is important to know which strategies generate a higher quality of reflection in students. They consider the figure of the university tutor who accompanies them in the process to be key. The initial teacher training model should be based on practices and action-research, as the practicum has an epistemological significance for the creation of new theoretical knowledge based on practice (Cochran-Smith, 2021; Dolz-Mestre, 2015).

The roots of the most important elements of CA in education were established by Tyler (1949). From 1993 to 2013, Biggs developed the cognitive systems approach, seeking to improve teaching through CA, addressing teaching for quality learning in higher education institutions (Biggs et al., 2001), and stressed the importance of improving the quality of teaching and learning (Biggs et al., 2001; Wang et al., 2013).

A learning approach is also influenced by the context and demands, and therefore describes the combination of an intention and a strategy when approaching a specific task, at a specific time (Richardson & Newby, 2006; Biggs et al., 2001). The practicum is a motivating context for students of the degree in ECE, and reflection seminars are an opportunity to open the minds of students towards deep learning.

Higher education has a growing diversity of students with increasingly more complex profiles and trajectories, which requires an adaptation of teaching and accompaniment processes. This diversity is reflected in different needs and expectations according to the areas of study and university trends, which makes it necessary to have a more personalised pedagogical design. In this sense, understanding how students learn allows us to adapt teaching strategies to favour deep learning and enhance the educational experience through spaces of dialogue and reflection (AQU, 2022).

In this context, intrinsic motivation and the use of strategies that involve thinking skills are basic instruments, and the supporting role of the tutor is key to offering these opportunities (Balslev et al., 2015; Balslev & Buysse, 2016). The educational potential of the teaching practicum in initial training is related to the preparation of the teachers who assume the tutorship (Correa, 2011). In order to combine strategies for change in teaching through practicum seminars, it is necessary to establish teaching dynamics and assessment methods that encourage engagement in and commitment to learning tasks.

Although earlier research pointed to the limited availability of empirical studies on how to promote teaching skills (Scheeler, 2008), more recent literature continues to highlight persistent challenges in this area. In particular, studies on the practicum emphasise ongoing difficulties in linking theory and practice, as well as the need for more structured pedagogical support and effective supervision processes (Bjørndal et al., 2024; Heinz, 2024). Furthermore, recent research suggests that there is still a limited understanding of how specific practicum designs contribute to the development of teaching competences (König et al., 2025; Shi et al., 2025; Zapatero-Ayuso et al., 2026).

Continuing professional development linked to real practices encourages ongoing teacher improvement, which is fundamental for enhancing learning and educational quality (Darling-Hammond, 2017). Tutoring in practicum seminars is a formative activity in a real, non-simulated situation, between adults. Small groups allow for student involvement and facilitate reflection and active learning (Biggs, 2014). To be effective, these seminars should have a series of characteristics that promote students' deep learning and personal and professional growth. They should serve to analyse and understand how theoretical concepts can be applied to real situations. They should encourage critical reflection on the

experiences lived during the practicum, helping students understand what they have done, why, and how they can improve.

Given this theoretical and contextual background, understanding preservice teachers' learning approaches before entering the practicum becomes essential for designing effective seminar structures. Despite extensive research on learning approaches in higher education, fewer studies have specifically examined second-year Early Childhood Education students' profiles in relation to practicum preparation, particularly in the Catalan context where student diversity is increasing.

This study aims to provide a descriptive and exploratory analysis of second-year ECE students' perceptions of their learning approaches prior to their practicum in order to inform the design of pedagogically sustainable practicum seminars that support reflective, inclusive, and competence-based teacher education.

The following research question guides this investigation: How do second-year students pursuing a degree in Early Childhood Education perceive their learning processes before starting the teaching practicum?

The subsequent sections present the methodology, results, and implications for designing pedagogically sustainable practicum seminars.

2. Materials and Methods

2.1. Design and Settings

This is a descriptive and exploratory study using a quantitative approach. It was conducted employing a cross-sectional questionnaire completed by second-year ECE students. The study does not test a prior hypothesis, aiming instead to quantitatively characterise students' learning approaches and identify factors that could improve practicum design. It was distributed at three Catalan universities: Universitat Internacional de Catalunya (UIC), a private university, and two public universities, Universitat de Barcelona (UB) and Universitat Autònoma de Barcelona (UAB). All three universities participated as members of the ARMIF 2020 research project, under the Teacher Training Improvement and Innovation Programme (MIF) (www.mif.cat (accessed on 24 May 2026)).

2.2. Participants

This study involved second-year ECE students at three universities in Catalonia, Spain: UIC, UB and UAB. Non-probabilistic methods were used to select the participants, as the questionnaires were distributed in class. The final sample included 311 students, 30 (9.6%) from UIC, 135 (43.4%) from UB, and 146 (46.9%) from UAB. No duplicates were found. A total of 12 missing values were identified (2 in the pathway to higher education variable and 10 among items of the Revised Two-Factor Study Process Questionnaire, R-SPQ-2F). Given the very low proportion of missing data, no imputation procedures were applied, as their impact on parameter estimates was expected to be negligible. Analyses were conducted using available data.

2.3. Data Collection

Data were collected during the second semester of 2022 before the start date of the practicum. The questionnaire was distributed during class to maximise participation. The questionnaires were self-administered and took approximately twenty minutes to complete.

2.4. Instrument Used

The Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) (Wang et al., 2013) was translated from English into Catalan through a collaborative process involving three independent translators using Maneesriwongul and Dixon's (Maneesriwongul & Dixon,

2004) model. The translated versions were then reviewed by a professional bilingual translator who performed a back-translation into English. The final version was refined based on this back-translation and validated in the Catalan context (Justicia et al., 2008; López-Aguado & Gutiérrez-Provecho, 2018; Vergara-Hernández et al., 2019).

A pilot study was also conducted with a small group of students to assess item clarity. While the items were generally well understood, participants reported some confusion regarding the literal translation of the Likert scale response options. To address this issue without altering the original meaning, brief clarifying phrases were added in capital letters to each response category (e.g., 1 = “This item is never or only rarely true of me” was supplemented with “NEVER OR ALMOST NEVER”). These adjustments aimed to improve the cultural and linguistic appropriateness of the instrument and to ensure accurate interpretation by participants.

Although the adaptation process included modifications to the response format, which were necessary to fit the study context, such changes may introduce slight interpretive differences compared to the original version of the instrument. However, the results obtained in this study suggest that the adapted version functions adequately in this context.

In addition to the R-SPQ-2F questionnaire, the students answered questions related to socio-demographic features (gender and age) and academic features (pathway to higher education).

2.5. Structure of the R-SPQ-2F Questionnaire

The R-SPQ-2F questionnaire is a self-report instrument designed to identify the learning approaches of university students, based on motivation (attitude toward studying) and strategy (usual way of studying). The shortened version consists of 20 items divided into two subscales: deep approach (DA) and surface approach (SA), with 10 items each.

Each dimension is measured through several items that capture students’ self-perceptions of their motivation and study strategies. For example, deep approach items include statements related to intrinsic interest and the intention to understand meaning, whereas surface approach items reflect a focus on memorising and minimum effort.

The instrument is structured around two main approaches to learning (deep and surface), each comprising motivational and strategic components. To facilitate understanding of how these constructs are implemented, Table 1 presents a summary of the dimensions along with illustrative example items.

Table 1. Dimensions, description and example items of the instrument.

Dimension/ Subfactor	Description	Example Item
Deep Approach—Motivation	Reflects intrinsic interest in learning and a genuine intention to understand ideas and meanings.	“I find that studying gives me a feeling of deep personal satisfaction.”
Deep Approach—Strategy	Involves the use of strategies aimed at understanding, such as relating ideas and integrating knowledge.	“I try to relate new material to what I already know.”
Surface Approach—Motivation	Reflects an extrinsic motivation focused on meeting minimum requirements or avoiding failure.	“My aim is just to pass the course while doing as little work as possible.”
Surface Approach—Strategy	Involves rote learning and memorisation without deeper understanding.	“I tend to memorise facts without trying to understand them.”

Each subscale is further divided into two scales derived from SAL theory. They reflect the congruence between motivation and strategy: deep motivation (DM) and deep strategy (DS) for deep learning, and surface motivation (SM) and surface strategy (SS) for surface learning (Biggs et al., 2001). A 5-point Likert scale measures the factors and includes the following response options: (1) never or rarely true, (2) sometimes true, (3) true half the time, (4) often true, and (5) always or almost always true. Scores were obtained for the

factors and sub-factors by adding the scores of the items they are made up of (Table 1). Factor scores range from 10 to 50, and sub-factor scores range from 5 to 25.

The two-factor structure of the Catalan version of the R-SPQ-2F questionnaire was tested using Confirmatory Factor Analysis (CFA). The following were found: a Comparative Fit Index (CFI) of 0.82, Root Mean Square Error of Approximation (RMSEA) of 0.07, Standardised Root Mean Residual (SRMR) of 0.07 and Tucker–Lewis Index (TLI) of 0.79. While the RMSEA and SRMR values fall within acceptable ranges (≤ 0.08), the CFI and TLI values are below the commonly recommended threshold of 0.95 (Hu & Bentler, 1999). This suggests that the two-factor model provides a reasonable but not optimal fit to the data, indicating that the instrument captures the intended constructs with acceptable robustness, though some refinement may be required in future studies.

The internal consistency of the two-factor structure was also tested using Cronbach’s alpha (Terwee et al., 2007; Prinsen et al., 2018), which was acceptable for the overall factors: 0.77 (95% CI: 0.73–0.88) for the deep approach (DA) and 0.78 (0.74–0.82) for the surface approach (SA). Sub-factors showed moderate reliability (DM = 0.64, DS = 0.62, SM = 0.64, SS = 0.64), which is expected given the small number of items per subscale. Removal of any item decreased reliability, further confirming the coherence and necessity of all items within the scale. CFA and internal consistency were conducted using functions implemented in the R packages lavaan (v0.6.21) (Rosseel, 2012) and pshyc (v2.6.5) (Revelle, 2025).

Table 2 is the authors’ own work based on the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) by Biggs (Biggs et al., 2001). This adapted version consists of 32 items. The table shows the eight subscales grouped under the two main dimensions (DA and SA), together with representative sample items.

Table 2. Relationship between learning approaches, sub-factors and items in the R-SPQ-2F questionnaire.

Learning Approach Factors	Sub-Factors of Learning Approaches	Items of Each Learning Approach in the R-SPQ-2F
Deep approach (DA)	Sub-factor: DM (deep motivation)	1, 5, 9, 13, 17
	Sub-factor: DS (deep strategy)	2, 6, 10, 14, 18
Surface approach (SA)	Sub-factor: SM (surface motivation)	3, 7, 11, 15, 19
	Sub-factor: SS (surface strategy)	4, 8, 12, 16, 20

2.6. Data Analysis

Sample characteristics were described overall and by university of origin to determine the comparability of subsamples and to assess whether the university variable could act as a potential confounding factor. Absolute frequencies and percentages were used to describe the sample characteristics, and differences according to university of origin were assessed using Fisher’s exact test due to low expected frequencies (<5), which violate the assumption of the chi-square test.

Learning approach factors (DA and SA) and sub-factors (DM, DS, SM, and SS) were described using mean and standard deviation (SD), median and interquartile range (IQR), and range (minimum and maximum). These factors and sub-factors, stratified by gender, age, and pathway to access higher education, were described using the same statistics. Differences between groups were assessed using the Kruskal–Wallis test, a non-parametric approach selected due to small sample sizes in certain groups (e.g., non-binary participants, $n = 2$; participants older than 26 years, $n = 12$; and those accessing university via the +25 test, $n = 6$), which may violate the assumptions of parametric tests. When significant differences were detected, post hoc pairwise comparisons were conducted using Wilcoxon rank-sum tests to determine which specific groups differed. The significance level was set at 0.05; in

case p -values were significant, they were adjusted for multiple comparisons using the False Discovery Rate (FDR) procedure to control for the expected proportion of false positives while maintaining statistical power.

The Tidyverse (v-2.0.0) collection of R packages (Wickham et al., 2019) implemented in R-4.2.2 (R Core Team, 2022) was used to perform statistical analysis.

3. Results

Table 3 presents the characteristics of the 311 study participants. Of these, 290 (93.2%) were female, and 256 (82.3%) were aged 18 to 22. The participants were evenly distributed between vocational course entry (VC) (48.2%) and university admission tests (UAT) (48.2%). No statistically significant differences in participant characteristics were observed across universities of origin, supporting the comparability of the subsamples across institutions.

Table 3. Features of the sample overall and stratified by university of origin.

Characteristic	University				q-Value ²
	Overall N = 311 ¹	UIC N = 30 ¹	UAB N = 135 ¹	UB N = 146 ¹	
Gender					0.22
Female	290 (93%)	25 (83%)	128 (95%)	137 (94%)	
Male	19 (6.1%)	5 (17%)	7 (5.2%)	7 (4.8%)	
Non-binary	2 (0.6%)	0 (0%)	0 (0%)	2 (1.4%)	
Age					0.93
18–22	256 (82%)	26 (87%)	113 (84%)	117 (80%)	
23–26	43 (14%)	3 (10%)	17 (13%)	23 (16%)	
>26	12 (3.9%)	1 (3.3%)	5 (3.7%)	6 (4.1%)	
Pathway					0.56
VC	150 (48%)	9 (30%)	65 (48%)	76 (52%)	
UAT	150 (48%)	21 (70%)	64 (47%)	65 (45%)	
+25	6 (1.9%)	0 (0%)	4 (3.0%)	2 (1.4%)	
Others	3 (1.0%)	0 (0%)	1 (0.7%)	2 (1.4%)	
Missing	2 (0.6%)	0 (0%)	1 (0.7%)	1 (0.7%)	

¹ n (%). ² FDR correction applied to Fisher's exact test p -values.

Table 4 summarises the descriptive statistics of students' learning approaches and their sub-dimensions. Overall, the participants showed slightly higher scores in the deep learning approach (mean = 27.2, SD = 5.7) compared to the surface approach (mean = 26.0, SD = 6.0), suggesting a modest tendency toward deeper learning. Deep motivation and deep strategy contributed equally to the deep approach, while surface strategy scored higher than surface motivation, indicating a stronger strategic than motivational component in surface learning. The distributions were generally consistent across mean and median values, although the wide ranges observed reflect considerable variability in students' learning patterns.

Table 4. Absolute frequency, mean and standard deviation (SD), median and interquartile range (IQR) and Range (minimum, maximum) of factors and subfactors.

Learning Approach	N = 311
Deep approach	
Mean (SD)	27.2 (5.7)
Median (Q1, Q3)	27.0 (23.0, 31.0)
Min, Max	11.0, 46.0

Table 4. Cont.

Learning Approach	N = 311
Deep motivation	
Mean (SD)	13.6 (3.2)
Median (Q1, Q3)	13.0 (11.0, 16.0)
Min, Max	5.0, 25.0
Deep strategy	
Mean (SD)	13.6 (3.1)
Median (Q1, Q3)	14.0 (11.0, 16.0)
Min, Max	5.0, 22.0
Surface approach	
Mean (SD)	26 (6)
Median (Q1, Q3)	26 (20, 30)
Min, Max	11, 44
Surface motivation	
Mean (SD)	11.3 (3.4)
Median (Q1, Q3)	11.0 (9.0, 14.0)
Min, Max	5.0, 22.0
Surface strategy	
Mean (SD)	14.3 (3.7)
Median (Q1, Q3)	14.0 (12.0, 16.0)
Min, Max	5.0, 25.0

Regarding stratified analyses by gender, women showed slightly higher scores than men on deep learning approach factors and sub-factors, whereas men tended to report higher scores on surface learning dimensions. However, none of these differences reached statistical significance (Table 5).

Table 5. Descriptive statistics and group comparisons of learning approaches of students by gender.

Characteristic	Gender			q-Value ¹
	Female N = 290	Male N = 19	Non-Binary N = 2	
Deep approach				0.65
Mean (SD)	27.2 (5.6)	26.7 (7.0)	30.5 (2.1)	
Median (Q1, Q3)	27.0 (23.0, 31.0)	26.0 (22.0, 32.0)	30.5 (29.0, 32.0)	
Min, Max	11.0, 46.0	15.0, 42.0	29.0, 32.0	
Deep motivation				0.72
Mean (SD)	13.6 (3.2)	13.3 (3.4)	14.0 (1.4)	
Median (Q1, Q3)	13.0 (11.0, 16.0)	13.0 (10.0, 15.0)	14.0 (13.0, 15.0)	
Min, Max	5.0, 25.0	9.0, 22.0	13.0, 15.0	
Deep strategy				0.52
Mean (SD)	13.6 (3.1)	13.4 (4.2)	16.5 (0.7)	
Median (Q1, Q3)	14.0 (11.0, 16.0)	12.0 (11.0, 17.0)	16.5 (16.0, 17.0)	
Min, Max	5.0, 22.0	6.0, 21.0	16.0, 17.0	
Surface approach				0.52
Mean (SD)	25 (6)	28 (5)	22 (8)	
Median (Q1, Q3)	25 (20, 30)	27 (24, 30)	22 (16, 28)	
Min, Max	11, 44	19, 41	16, 28	
Surface motivation				0.36
Mean (SD)	11.2 (3.5)	12.9 (2.9)	10.0 (2.8)	
Median (Q1, Q3)	11.0 (9.0, 14.0)	13.0 (11.0, 15.0)	10.0 (8.0, 12.0)	
Min, Max	5.0, 22.0	7.0, 18.0	8.0, 12.0	
Surface strategy				0.72
Mean (SD)	14.2 (3.7)	15.0 (3.4)	12.0 (5.7)	
Median (Q1, Q3)	14.0 (11.0, 17.0)	14.0 (13.0, 16.0)	12.0 (8.0, 16.0)	
Min, Max	5.0, 23.0	9.0, 25.0	8.0, 16.0	

¹ FDR correction applied to Kruskal–Wallis test *p*-values.

Deep learning approach scores increased with age, with statistically significant differences observed between the oldest group and both the youngest group and those aged 23–26 (Tables 6 and 7). This pattern was consistent across deep motivation and deep strategy sub-factors. In contrast, surface learning approach scores decreased with age, with the oldest group showing significantly lower scores compared to the younger groups. These differences were also reflected in surface strategy and, to a lesser extent, surface motivation.

Table 6. Descriptive statistics and group comparisons of learning approaches by age group.

Characteristic	Age			q-Value ¹
	18–22 N = 256	23–26 N = 43	>26 N = 12	
Deep approach				<0.001
Mean (SD)	26.7 (5.4)	27.9 (5.4)	35.4 (6.8)	
Median (Q1, Q3)	27.0 (23.0, 31.0)	28.0 (24.0, 32.0)	33.5 (30.0, 41.0)	
Min, Max	11.0, 42.0	15.0, 38.0	26.0, 46.0	
Deep motivation				<0.001
Mean (SD)	13.3 (3.0)	14.1 (2.9)	18.2 (3.8)	
Median (Q1, Q3)	13.0 (11.0, 15.0)	15.0 (12.0, 16.0)	19.0 (15.5, 20.0)	
Min, Max	5.0, 22.0	9.0, 19.0	12.0, 25.0	
Deep strategy				0.006
Mean (SD)	13.4 (3.0)	13.8 (3.0)	17.3 (3.9)	
Median (Q1, Q3)	13.0 (11.0, 15.0)	14.0 (12.0, 16.0)	16.5 (14.5, 21.0)	
Min, Max	5.0, 21.0	6.0, 19.0	11.0, 22.0	
Surface approach				0.010
Mean (SD)	26 (6)	26 (7)	19 (6)	
Median (Q1, Q3)	26 (22, 30)	26 (20, 31)	17 (14, 26)	
Min, Max	11, 44	13, 43	12, 29	
Surface motivation				0.059
Mean (SD)	11.4 (3.3)	11.4 (4.1)	9.0 (2.8)	
Median (Q1, Q3)	11.0 (9.0, 14.0)	12.0 (8.0, 14.0)	8.5 (6.5, 11.5)	
Min, Max	5.0, 22.0	5.0, 22.0	5.0, 14.0	
Surface strategy				0.006
Mean (SD)	14.4 (3.5)	14.5 (3.7)	10.3 (3.9)	
Median (Q1, Q3)	14.0 (12.0, 17.0)	14.0 (11.0, 17.0)	8.5 (8.0, 14.0)	
Min, Max	5.0, 23.0	8.0, 25.0	6.0, 17.0	

¹ FDR correction applied to Kruskal–Wallis test *p*-values.

Table 7. Pairwise comparisons of learning approaches across age groups.

Learning Approach	Comparison	q-Value ¹
Deep approach	18–22 vs. 23–26	0.113
Deep approach	18–22 vs. >26	<0.001
Deep approach	23–26 vs. >26	0.005
Deep motivation	18–22 vs. 23–26	0.055
Deep motivation	18–22 vs. >26	<0.001
Deep motivation	23–26 vs. >26	0.003
Deep strategy	18–22 vs. 23–26	0.318
Deep strategy	18–22 vs. >26	0.003
Deep strategy	23–26 vs. >26	0.015
Surface approach	18–22 vs. 23–26	0.924
Surface approach	18–22 vs. >26	0.006
Surface approach	23–26 vs. >26	0.015
Surface strategy	18–22 vs. 23–26	0.986
Surface strategy	18–22 vs. >26	<0.001
Surface strategy	23–26 vs. >26	0.003

¹ *p*-values from pairwise Wilcoxon rank-sum tests were adjusted using FDR correction.

Participants entering university via the 25+ access route tended to show higher scores on deep learning approaches and related sub-dimensions compared to other entry pathways. While some differences reached statistical significance at the unadjusted level, these were not retained after FDR correction. No consistent patterns were observed for surface learning across pathways (Table 8).

Table 8. Descriptive and group comparisons of learning approaches by pathway to access university.

Characteristic	Pathway to Higher Education					q-Value ¹
	VC N = 150	UAT N = 150	+25 N = 6	Others N = 3	Missing N = 2	
Deep approach						0.076
Mean (SD)	26.8 (5.6)	27.2 (5.4)	35.7 (9.8)	32.7 (2.9)	21.0 (NA)	
Median (Q1, Q3)	27.0 (23.0, 31.0)	27.0 (23.0, 31.0)	36.0 (29.0, 45.0)	31.0 (31.0, 36.0)	21.0 (21.0, 21.0)	
Min, Max	11.0, 39.0	17.0, 42.0	22.0, 46.0	31.0, 36.0	21.0, 21.0	0.076
Deep motivation						
Mean (SD)	13.4 (3.0)	13.6 (3.1)	17.7 (5.6)	17.7 (3.2)	11.0 (1.4)	0.076
Median (Q1, Q3)	13.0 (11.0, 16.0)	13.0 (11.0, 16.0)	17.0 (13.0, 23.0)	19.0 (14.0, 20.0)	11.0 (10.0, 12.0)	
Min, Max	5.0, 19.0	8.0, 22.0	11.0, 25.0	14.0, 20.0	10.0, 12.0	
Deep strategy						0.076
Mean (SD)	13.4 (3.1)	13.6 (3.0)	18.0 (4.4)	15.0 (3.5)	9.0 (NA)	
Median (Q1, Q3)	14.0 (11.0, 15.0)	13.0 (12.0, 16.0)	18.5 (16.0, 22.0)	17.0 (11.0, 17.0)	9.0 (9.0, 9.0)	
Min, Max	5.0, 21.0	7.0, 21.0	11.0, 22.0	11.0, 17.0	9.0, 9.0	0.11
Surface approach						
Mean (SD)	26 (6)	25 (7)	22 (8)	19 (1)	32 (7)	0.43
Median (Q1, Q3)	26 (22, 30)	25 (20, 30)	22 (15, 29)	18 (18, 20)	32 (27, 37)	
Min, Max	12, 44	11, 44	13, 32	18, 20	27, 37	
Surface motivation						0.076
Mean (SD)	11.6 (3.5)	11.2 (3.4)	10.0 (3.8)	9.0 (2.0)	12.5 (2.1)	
Median (Q1, Q3)	11.0 (9.0, 14.0)	11.0 (9.0, 14.0)	10.0 (7.0, 14.0)	9.0 (7.0, 11.0)	12.5 (11.0, 14.0)	
Min, Max	5.0, 22.0	5.0, 22.0	5.0, 14.0	7.0, 11.0	11.0, 14.0	0.076
Surface strategy						
Mean (SD)	14.5 (3.3)	14.1 (3.9)	12.2 (4.7)	9.7 (1.2)	19.5 (4.9)	0.076
Median (Q1, Q3)	15.0 (12.0, 16.0)	14.0 (11.0, 17.0)	11.5 (8.0, 16.0)	9.0 (9.0, 11.0)	19.5 (16.0, 23.0)	
Min, Max	6.0, 25.0	5.0, 23.0	8.0, 18.0	9.0, 11.0	16.0, 23.0	

¹ FDR correction applied to Kruskal–Wallis test *p*-values.

4. Discussion

This study analyses the learning approaches of second-year ECE students from three Catalan universities prior to their practicum. The findings, based on a self-perception questionnaire, highlight the importance of motivation and learning strategies in shaping learning behaviours. Although the study does not collect specific data on the practicum, the results have relevant implications for the design of practicum seminars, particularly in terms of adapting learning activities to promote a deeper approach.

Given the descriptive nature of the design, the pedagogical implications discussed are not presented as direct empirical generalizations, but are also grounded in well-established literature on deep learning approaches, particularly regarding reflection, meaning-making, and active engagement. These implications should therefore be understood as theoretically informed proposals.

The findings suggest that, prior to the practicum, students have not yet developed a consistently deep learning approach, which may constrain their capacity to engage critically with complex classroom situations. This pattern appears to reflect the increasing heterogeneity of student profiles in higher education, characterised by more fragmented and less linear academic trajectories (Monroy & Hernández-Pina, 2014). This shift calls for changes in teaching and learning models to better meet diverse student needs and support their academic and professional development.

Age and employment appear to be relevant factors shaping learning approaches. As reported in the Via Universitària III study (AQU, 2022), many education students combine work and study, which may influence how they engage with academic tasks. Overall, the findings point to a tendency for younger students to adopt more surface-oriented and instrumental approaches, whereas older students—often entering through alternative pathways—tend to report deeper learning approaches, possibly reflecting greater experience with autonomous learning. However, these findings should be interpreted with caution, as the study was not designed to test statistically significant differences between groups. This interpretation is cautiously consistent with previous research indicating that

students' learning approaches may be influenced by their academic trajectories and study conditions (Bailey & Phillips, 2016; Hidi, 2016).

These patterns may be influenced by contextual constraints, particularly limited study time and competing demands such as employment. In this context, classroom attendance may become the primary opportunity for academic engagement, favouring more surface-oriented strategies that require less sustained investment. Similarly, the tendency of older students to adopt deeper approaches may be related to greater experience with autonomous learning. This pattern has also been identified in previous research (Niehaus et al., 2012; Bailey & Phillips, 2016; Hidi, 2016; Mertens et al., 2024).

However, adopting deep learning approaches should not be understood as something solely dependent on students' predispositions. It is strongly influenced by contextual and pedagogical factors, including teaching methodologies, the design of learning activities, and the pedagogical competence of university instructors. In this context, practicum seminars should be understood as structured learning environments in which teaching decisions play a key role in fostering reflective and meaningful learning processes. This perspective is consistent with research stressing the importance of teaching–learning environments in shaping students' approaches to learning (Lizzio et al., 2002).

Given that no significant differences were observed by gender, and considering that most students enter university at an early age (18–19), entry-level maturity should not be understood as a determining constraint. Rather, these findings highlight the importance of strengthening pedagogical design—particularly through practicum seminars—as a key lever to foster deeper learning approaches. In this regard, learning approaches should not be understood solely as individual traits, but as context-dependent processes influenced by teaching practices, assessment methods, and the broader learning environment.

Practicum seminars offer a valuable opportunity to foster deep learning through reflection and the application of knowledge in meaningful, real-life contexts. From this perspective, the practicum should be understood as a space for continuous reflection—both individual and collective—grounded in the integration of research and practice (Korthagen, 2016). Students' perceptions of their learning environment directly influence their study approaches, and when learning activities align with their interests and motivations, they are more likely to engage in deep learning (Lizzio et al., 2002; García-Pérez et al., 2020).

The study provides a data-informed snapshot that can guide the design of targeted pedagogical interventions. These findings point to several key factors that may support the promotion of deeper learning approaches, including the design of learning environments aligned with intended learning outcomes; the enhancement of intrinsic motivation through meaningful and professionally relevant tasks; the use of reflective and integrative learning strategies that encourage understanding, critical reflection, and knowledge integration; and the implementation of structured opportunities for reflection on practice. These elements are closely linked to the alignment between learning objectives, teaching methods, and assessment. Additionally, attention to students' diverse academic profiles may help tailor pedagogical interventions more effectively.

In this regard, structuring practicum seminars around Biggs' model of constructive alignment (Biggs & Tang, 2022) can be a key strategy to promote meaningful and professionalised learning. This approach emphasises the coherence between learning objectives, teaching activities, and assessment methods to ensure the development of transferable competencies. In the context of the practicum, this alignment is particularly important, as learning depends not only on what occurs in the university classroom but also on students' experiences in schools. Therefore, practicum seminar design should ensure coherence between reflective work and practical experience (Biggs & Tang, 2022; Hailikari et al., 2022).

Furthermore, when learning objectives and assessment activities are properly aligned, students are more likely to adopt deep learning strategies, which are essential in the training of future teachers (Panadero et al., 2018).

Limitations

This study presents several limitations that should be considered when interpreting the findings, while also offering directions for future research.

The first limitation concerns the sample and its generalisability. The study included 311 students from three Catalan universities, selected through convenience sampling. When compared with the overall student population enrolled in Early Childhood Education degrees at these institutions, some imbalances were identified. In particular, students from the University of Barcelona were overrepresented, while students from the Autonomous University of Barcelona were underrepresented. The proportion of students from the International University of Catalonia was largely aligned with the population distribution (Universitat Autònoma de Barcelona, 2022; Universitat de Barcelona, 2025). Although the sample partially reflects the institutional structure, these discrepancies, together with the non-probability sampling strategy, may limit the representativeness of the sample and the extent to which the findings can be generalised beyond the specific institutional context.

A second limitation relates to the research design and data collection procedures. The study relies on self-reported data, which may be affected by social desirability and self-presentation biases, leading participants to align their responses with perceived expectations or to overestimate desirable learning behaviours (Grimm, 2010). In addition, the cross-sectional design captures learning approaches at a single point in time, prior to the practicum, which prevents the analysis of developmental trajectories and does not allow causal inferences. Future research could adopt a longitudinal design to examine the development of students' learning strategies throughout the practicum and beyond.

Finally, a third limitation concerns the contextual and disciplinary scope of the study. The research is situated within Early Childhood Education degrees in three universities in Catalonia, which may limit the transferability of the findings to other disciplines, institutional contexts, or higher education systems. Future research could address this limitation by incorporating other academic fields or conducting comparative studies across regions or countries.

5. Conclusions

This study examined second-year Early Childhood Education students' self-perceptions of their learning approaches prior to the practicum. The findings indicate that students report varying levels of motivation and use of learning strategies, with a tendency towards less consolidated deep learning approaches at this stage of their training.

The results also suggest differences associated with students' profiles, particularly in relation to age and academic pathways, although these should be interpreted with caution. These findings highlight the importance of designing practicum seminars that actively promote deep learning through reflection, alignment between theory and practice, and well-structured pedagogical support.

Overall, the study provides a data-informed basis for improving the design of pre-practicum and practicum learning environments in teacher education. The findings stress the importance of the pre-practicum stage as a key moment for pedagogical intervention, allowing teacher education programs to better support students in developing deeper learning approaches and bridging the gap between theory and practice.

Within this framework, constructive alignment (Biggs & Tang, 2022) becomes especially relevant for designing coherent and meaningful learning environments. Practicum

seminars, when carefully structured, can play a central role in fostering reflective and professionalised deep learning.

These findings reinforce the role of practicum seminars as strategic spaces for sustainable teacher education, capable of supporting students' transition from surface to deep learning approaches.

In an evolving educational context increasingly shaped by digitalisation, fostering deep and reflective learning remains essential to support students' critical thinking and autonomy. Further research should continue exploring how practicum-related pedagogical designs can better promote deep learning in diverse higher education contexts.

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Abbreviations

The following abbreviations are used in this manuscript:

DA	Deep approach
DS	Deep strategy
DM	Deep motivation
SA	Surface approach
SS	Surface strategy
SM	Surface motivation
CA	Constructive alignment
RSPQ	Revised Two-Factor Study Process Questionnaire
ECE	Early Childhood Education
UIC	Universitat Internacional de Catalunya
UB	Universitat de Barcelona
UAB	Universitat Autònoma de Barcelona

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