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Rethinking teaching readiness: how self-regulated learning transforms prior knowledge and pedagogical competence in early childhood education

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ABSTRACT

This study addresses a critical gap in teacher education literature concerning how knowledge is transformed into teaching readiness. Although prior knowledge and pedagogical content knowledge (PCK) are widely recognized as essential, the mechanisms linking them to professional readiness remain underexplored. This study proposes self-regulated learning (SRL) as a transformative mechanism connecting knowledge and teaching readiness. A quantitative explanatory design using Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed, involving 199 early childhood teacher education students in Indonesia. The results show that prior knowledge has the strongest effect on SRL ($\beta = 0.497$, $t = 7.644$), while PCK exerts a substantial direct effect on teaching readiness ($\beta = 0.406$, $t = 5.000$). SRL significantly influences teaching readiness ($\beta = 0.240$, $t = 2.683$) and partially mediates the effects of prior knowledge ($\beta = 0.119$, $t = 2.659$) and PCK ($\beta = 0.107$, $t = 2.306$). These findings indicate that teaching readiness emerges through self-regulatory processes rather than direct knowledge acquisition. This study offers a novel mechanism-based perspective by positioning SRL as a central process in transforming knowledge into professional competence.

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Introduction

The readiness of university students to teach in kindergarten can no longer be understood merely as the final outcome of administrative coursework, but rather as a complex professional capacity formed through the interaction of prior knowledge, pedagogical content knowledge, self-regulation, and the ability to translate these into instructional practices aligned with the characteristics of early childhood learners. This shift is driven by the demands of 21st-century education, the integration of technology, the need for inclusive learning environments, and increasing expectations regarding the quality of teacher graduates, all of which require prospective educators to possess a level of readiness that extends beyond the mastery of child development theories or general teaching methods (Papavlasopoulou et al., 2024; Yang et al., 2024; Rahmi et al., 2024). In this context, higher education institutions play a strategic role as spaces for the development of initial professional readiness, as pre-service kindergarten teachers are not only expected to understand children as unique learners but also to design learning experiences that are safe, meaningful, contextual, and responsive to

children's socio-emotional, language, cognitive, and motor development even before entering real classroom settings (Weyers et al., 2024; Schmitt et al., 2023; Kewalramani et al., 2025).

Despite this expectation, a persistent gap remains between what students know and what they are able to perform in real teaching contexts. Many education students enter practicum stages or transition into the profession with varying levels of confidence, pedagogical mastery, and psychological preparedness. As a result, they often possess declarative knowledge but are not fully prepared to manage classrooms, select appropriate instructional strategies, adapt learning to children's needs, or make rapid pedagogical decisions in real situations (Anandari et al., 2025; Wang et al., 2024; Njiku, 2025). This discrepancy raises a critical theoretical issue: knowledge acquisition alone does not automatically translate into professional readiness. Recent findings indicate that teaching readiness is not a singular construct but encompasses cognitive, affective, behavioral, and adaptive dimensions that develop through structured learning experiences, practical opportunities, self-reflection, and the interaction between students' initial characteristics and the quality of teacher education experiences they receive (Wang et al., 2024; Weyers et al., 2024; Fernández-Ortube et al., 2024). Therefore, discussions on students' readiness to teach in kindergarten should not only focus on the accumulation of knowledge, but also on the mechanisms through which knowledge is transformed into actionable professional competence. One fundamental component in explaining this transformation is prior knowledge, defined as the knowledge, experiences, beliefs, and cognitive schemas that students possess before engaging in new learning at the university level. Prior knowledge determines how students interpret, filter, connect, and organize new information into their existing cognitive structures (Hulings, 2022; Lestari, 2025; Weyers et al., 2024). In teacher education, students never enter the classroom as blank slates; rather, they bring prior learning experiences, perceptions of teachers, conceptions of children, and implicit beliefs about how learning should occur. These elements can serve both as valuable assets and as sources of misconceptions that influence the quality of professional learning developed during their studies (, 2022; Fernández-Ortube et al., 2024; Weyers et al., 2024). Consequently, prior knowledge should not be viewed merely as an academic background, but as a cognitive foundation that shapes learning processes, reflective capacity, and the ability to engage in professional preparation.

In addition to prior knowledge, pedagogical content knowledge (PCK) is a critical variable influencing teaching readiness. PCK refers to the form of professional knowledge that enables prospective teachers to transform subject matter into instructional representations that are understandable for learners according to their age, characteristics, and learning context (Schmitt et al., 2023; Njiku, 2025; Weyers et al., 2024). Particularly in early childhood education, where learning is rooted in play, interaction, and experiential engagement, PCK determines how effectively knowledge can be translated into pedagogical action (Schmitt et al., 2023; Kewalramani et al., 2025; Yang et al., 2024). However, even when students possess strong prior knowledge and PCK, this does not necessarily guarantee their readiness to teach. This condition highlights a deeper issue: the presence of knowledge does not inherently ensure its application. To address this gap, self-regulated learning (SRL) emerges as a critical mechanism. SRL refers to the ability to set goals, select strategies, monitor understanding, regulate motivation, manage time, and evaluate learning outcomes independently (Fernández-Ortube et al., 2024; Zhang et al., 2023; Sulistiani et al., 2024). Beyond functioning as an individual learning skill, SRL plays a transformative role in enabling students to actively process, adapt, and operationalize knowledge within dynamic learning and teaching contexts. In teacher education, this is particularly important because students must simultaneously function as learners and future educators, requiring not only cognitive understanding but also the ability to regulate their own professional development (Fernández-Ortube et al., 2024; Zhang et al., 2023; Weyers et al., 2024).

The relationship between knowledge and SRL can be understood as a dynamic and reciprocal process rather than a purely linear pathway. Students with stronger prior knowledge and PCK are generally better able to identify learning goals, evaluate task demands, and select appropriate strategies, leading to stronger self-regulation (Lestari, 2025; Sulistiani et al., 2024; Zhang et al., 2023). At the same time, SRL enables students to refine, reorganize, and apply their knowledge in meaningful ways, suggesting that knowledge and regulation mutually reinforce each other over time. This perspective challenges the assumption that knowledge directly leads to readiness and instead emphasizes that readiness emerges through an active process of regulation, reflection, and adaptation. SRL contributes directly to teaching readiness, as readiness requires the ability to cope with uncertainty, respond to classroom dynamics, and continuously learn from experience (Putri et al., 2024; Anandari et al., 2025; Wang et al., 2024). Students with high SRL are more reflective, proactive, and adaptive, enabling them to translate knowledge into professional action more effectively (Fernández-Ortube et al., 2024; Anandari et al., 2025; Zhang et al., 2023). In this sense, SRL functions not merely as a mediator, but as a transformative mechanism that converts cognitive and pedagogical knowledge into professional readiness.

Based on these considerations, this study proposes a model that positions prior knowledge and pedagogical content knowledge as foundational inputs, self-regulated learning as a transformative mechanism, and teaching readiness as the outcome. Unlike conventional linear models, this framework emphasizes that the effect of knowledge on readiness is not direct, but occurs through an internal process of regulation and adaptation (Fernández-Ortube et al., 2024; Sulistiani et al., 2024; Wang et al., 2024).

Despite extensive research on prior knowledge, pedagogical content knowledge, and self-regulated learning, existing studies largely examine these constructs in isolation rather than as part of an integrated process. Limited attention has been given to the mechanisms through which knowledge is transformed into teaching readiness, particularly through self-regulated learning. This gap is especially evident in early childhood teacher education and becomes more pronounced in the Indonesian context, where variations in institutional quality, practicum exposure, and curriculum implementation remain significant (Rahmi et al., 2024; Putri et al., 2024; Wang et al., 2024). Existing studies tend to focus on direct relationships between variables, without adequately explaining the underlying processes linking knowledge and readiness. Therefore, this study addresses this gap by offering a more integrative and theoretically grounded explanation of teaching readiness, positioning self-regulated learning as a key mechanism through which prior knowledge and pedagogical content knowledge are transformed into professional competence.

Based on the theoretical considerations and identified research gap, this study addresses the following research questions 1) How do prior knowledge and pedagogical content knowledge influence self-regulated learning among early childhood teacher education students?; 2)How does self-regulated learning contribute to teaching readiness?; 3) To what extent does self-regulated learning mediate the relationship between prior knowledge, pedagogical content knowledge, and teaching readiness?

Method

This study employs a quantitative explanatory research design using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships among Prior Knowledge (PK), Pedagogical Content Knowledge (PCK), Self-Regulated Learning (SRL), and Teaching Readiness (TR) among early childhood teacher education students. Rather than merely identifying associations, this design enables the analysis of directional relationships among latent variables and the examination of underlying mechanisms through which knowledge is transformed into professional readiness. In this study, self-regulated learning is conceptually positioned as a mediating variable that explains how prior knowledge and pedagogical content knowledge are translated into teaching readiness. To analyze the relationships between variables, measurement instruments were adopted from previously validated studies. Prior knowledge was measured using instruments adapted from (Dochy et al., 1999; Simonsmeier et al., 2021; König et al., 2017). Pedagogical content knowledge was measured using instruments derived from (Shulman, 1987; Gasteiger et al., 2020; König et al., 2017). Self-regulated learning was measured using established scales from (Zimmerman, 2000; Panadero, 2017; Fernández-Ortube et al., 2024; Pintrich, 2004). Teaching readiness was measured using instruments adapted from (König et al., 2017; Girgin & Akcanca, 2021).

Although these instruments have been validated in prior research, their application within the Indonesian early childhood teacher education context required careful adaptation. Therefore, a pilot test involving 30 students outside the main sample was conducted to assess clarity, contextual relevance, and measurement consistency. This process ensured that the instruments were comprehensible and appropriate for the local context while maintaining their original construct validity. Minor adjustments were made to wording and phrasing to improve contextual alignment without altering the underlying constructs.

Data were collected through a structured survey administered via an online questionnaire using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) (Abraham & Sickel, 2025). The target population consisted of early childhood teacher education students from the Faculty of Education Science at Universitas Negeri Padang, West Sumatra, Indonesia. Respondents were selected using a simple random sampling technique based on the official enrollment list provided by the department, ensuring that each student had an equal probability of participation. The final sample comprised 199 respondents, which is considered adequate for PLS-SEM analysis, as it exceeds the minimum requirements based on the 10-times rule and recommended guidelines for structural model estimation.

To minimize potential common method bias associated with self-report data, several procedural remedies were applied. These included ensuring respondent anonymity, reducing evaluation apprehension, and separating measurement items across constructs to avoid response pattern bias. In addition, statistical assessment was conducted during data analysis to confirm that common method variance did not significantly affect the results. The demographic results of the respondents are shown in Table 1.

Table 1. Respondent demography

Sample characterization		Frequency	Percentage
Gender	Male	1	0,50
	Female	198	99,50
Age	18-19	45	22,61
	20-21	76	38,19
	22-23	35	17,59
	Above 23	43	21,61
Semester	2	95	47,74
	4	5	2,51
	6	69	34,67
	8	27	13,57
	Other	3	1,51
Teaching experience in Early Childhood Education	Yes/Ever	89	44,72
	No/Never	110	55,28
Practical teaching experience (Student teaching/Internship)	Yes/Done	47	23,62
	No/Not yet	152	76,38
Childhood education training experience	Has participated in training	58	29,15
	Has never participated in training	141	70,85
	Total	199	100,00

Based on respondent demographics, 1 respondent (0.50%) was male, and 198 respondents (99.50%) were female, indicating that the sample was overwhelmingly dominated by female participants. In terms of age distribution, the majority of respondents were aged 20–21 years (76 respondents; 38.19%), followed by those aged 18–19 years (45 respondents; 22.61%). Respondents aged above 23 years accounted for 43 individuals (21.61%), while those aged 22–23 years represented the smallest proportion within the main age groups (35 respondents; 17.59%). Regarding semester level, most respondents were in semester 2 (95 respondents; 47.74%), followed by semester 6 (69 respondents; 34.67%).

A smaller proportion were in semester 8 (27 respondents; 13.57%), while only 5 respondents (2.51%) were in semester 4. Additionally, 3 respondents (1.51%) were categorized under other semesters. With respect to teaching experience in Early Childhood Education, 110 respondents (55.28%) reported that they had never had teaching experience, while 89 respondents (44.72%) indicated that they had prior experience. In terms of practical teaching experience (such as student teaching or internships), the majority of respondents had not yet undertaken such experiences (152 respondents; 76.38%), whereas only 47 respondents (23.62%) had completed practical teaching activities. Furthermore, regarding participation in childhood education training, most respondents had never participated in any training (141 respondents; 70.85%). In contrast, 58 respondents (29.15%) reported that they had participated in relevant training programs. The sample consisted of 199 respondents (100%), predominantly female, mostly in early semesters, and largely lacking formal teaching, practicum, and training experience in early childhood education.

Data analysis was performed using SmartPLS software, applying PLS-SEM techniques to evaluate both the measurement model and the structural model. This approach was selected due to its suitability for analyzing complex relationships among latent constructs and its robustness in handling non-normal data distributions (Li et al., 2023). The analysis includes assessment of reliability, convergent validity, discriminant validity, and structural relationships among variables. In addition to path coefficients and statistical significance, effect sizes and explanatory power were examined to provide a more comprehensive interpretation of the findings.

Results and Discussions

Validity and Reliability

In SEM-PLS analysis, the evaluation of the measurement model is a critical step to ensure that the constructs are measured accurately and consistently. Validity testing aims to confirm that the instruments capture the intended constructs, while reliability testing ensures the internal consistency of the measurement (Pollmeier et al., 2024; Kramarski & Michalsky, 2010). In this study, convergent validity was assessed using Average Variance Extracted (AVE), while discriminant validity was evaluated using the Heterotrait-Monotrait Ratio

(HTMT) (Henseler et al., 2015). Reliability was assessed through Cronbach's alpha and composite reliability (CR), with threshold values above 0.70 and AVE above 0.50 (Hair et al., 2021). Table 2 presents the results of the construct validity and reliability tests.

Table 2. Construct validity and reliability

Variables	Cronbach's alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Pedagogical Content Knowledge (PCK)	0.887	0.922	0.748
Prior Knowledge (PK)	0.909	0.936	0.785
Self-Regulated Learning (SRL)	0.898	0.929	0.765
Teaching Readiness (TR)	0.911	0.938	0.790

Analysis results indicated that all constructs demonstrate strong internal consistency reliability, as reflected by Cronbach's alpha and composite reliability (CR) values exceeding the recommended threshold of 0.70. Specifically, Pedagogical Content Knowledge (PCK) showed a Cronbach's alpha of 0.887 and CR of 0.922, Prior Knowledge (PK) had a Cronbach's alpha of 0.909 and CR of 0.936, Self-Regulated Learning (SRL) recorded a Cronbach's alpha of 0.898 and CR of 0.929, while Teaching Readiness (TR) achieved the highest reliability with a Cronbach's alpha of 0.911 and CR of 0.938.

These findings indicate that all constructs possess high internal consistency and reliability. Furthermore, the Average Variance Extracted (AVE) values for all variables are above the acceptable threshold of 0.50, confirming adequate convergent validity. The AVE values were 0.748 for PCK, 0.785 for PK, 0.765 for SRL, and 0.790 for TR. These results suggest that each construct is able to explain more than 50% of the variance of its indicators. These findings confirm that the measurement model meets the criteria for both reliability and convergent validity. This indicates that the indicators used in this study are valid, consistent, and capable of accurately representing their respective latent constructs, thereby strengthening the robustness of the research measurement model.

Table 3. Heterotrait-Monotrait Ratio of Correlations (HTMT)

Variable	PCK	PK	SRL	TR
Pedagogical Content Knowledge (PCK)				
Prior Knowledge (PK)	0.806			
Self-Regulated Learning (SRL)	0.850	0.851		
Teaching Readiness (TR)	0.867	0.819	0.844	

Furthermore, as presented in Table 3, the correlation values among the constructs are all below the threshold of 0.90, indicating that the model meets the criteria for discriminant validity. This suggests that each construct is empirically distinct and measures different concepts within the model. The highest correlation was observed between Teaching Readiness (TR) and Pedagogical Content Knowledge (PCK), with a value of 0.867, indicating a strong relationship between these two variables. Meanwhile, the correlation between Self-Regulated Learning (SRL) and Prior Knowledge (PK) also showed a relatively high value of 0.851, followed closely by the correlation between SRL and PCK at 0.850, and between TR and SRL at 0.844.

In contrast, the lowest correlation was found between Prior Knowledge (PK) and PCK, with a value of 0.806, although this still indicates a substantial relationship. The correlation between TR and PK was 0.819, which falls within a moderate to strong range. These results confirm that all inter-construct correlations remain below the critical value of 0.90, thereby supporting adequate discriminant validity. This indicates that each latent variable in the model captures a unique dimension, and there is no issue of multicollinearity or construct redundancy among the variables.

Hypothesis Result

Figure 1 illustrates the pathways of all research hypotheses. These pathways represent hypotheses formulated based on the research framework. Through this visualization, readers can understand how the constructs in the study are directly interconnected, in line with the research objectives. Then, Table 4 complements the description of the figure by presenting the relationships in the form of specific numerical values.

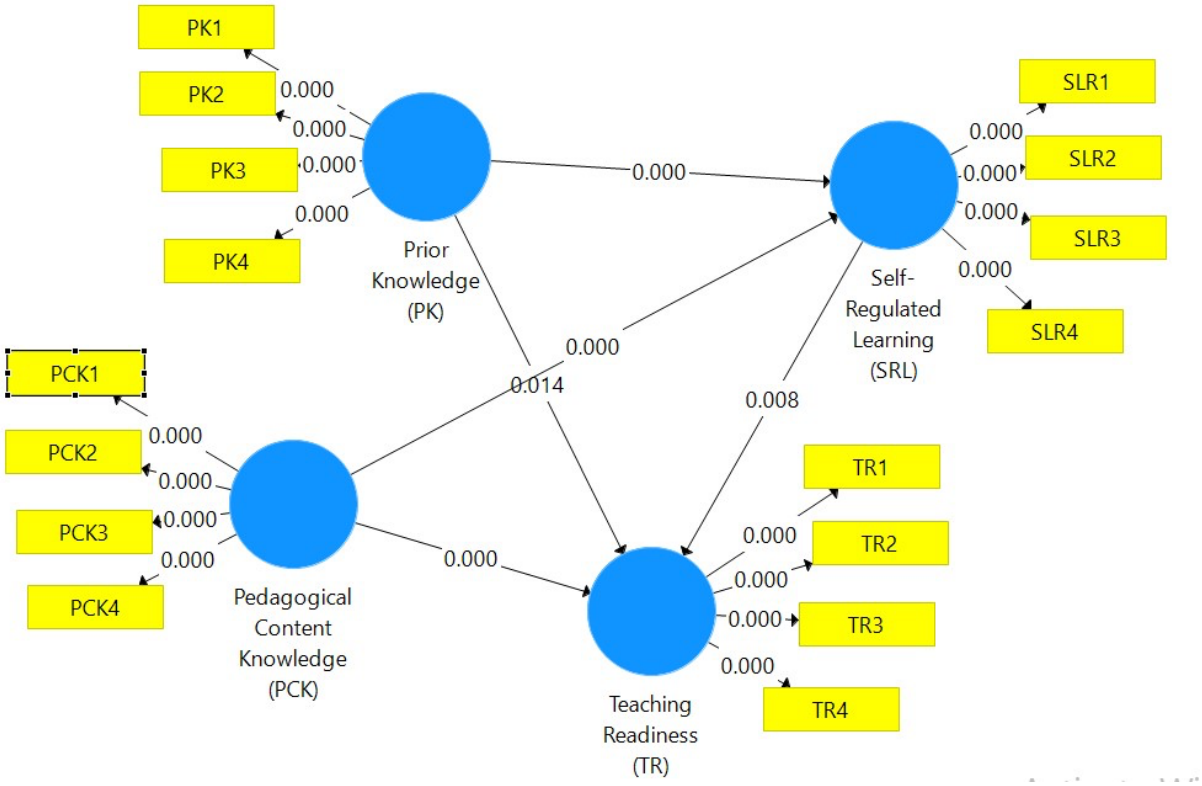


Figure 1. Hypothesis result

A hypothesis is considered to have a positive effect if the path coefficient value is positive. A hypothesis is considered significant if the p-value is less than 0.05. Lastly, a hypothesis is accepted if the t-statistic value exceeds 1.96 (Rizal et al., 2022).

Table 4. Hypothesis testing result

Hypothesis	*β*	*t*	*P*	Result
Direct effect				
H1. PCK -> SRL	0.444	7.007	0.000	Accepted
H2. PCK -> TR	0.406	5.000	0.000	Accepted
H3. PK -> SRL	0.497	7.644	0.000	Accepted
H4. PK-> TR	0.211	2.475	0.014	Accepted
H5. SRL ->TR	0.240	2.683	0.008	Accepted
Indirect effect				
H6. PCK->SRL->TR	0.107	2.306	0.022	Accepted
H7. PK->SRL->TR	0.119	2.659	0.008	Accepted

The results of the hypothesis testing presented in Table 4 indicate that all proposed relationships in the model are positive and statistically significant. However, beyond statistical significance, the relative strength of the relationships provides important insights into the roles of each construct within the model. For the direct effects, Pedagogical Content Knowledge (PCK) shows a significant positive effect on Self-Regulated Learning (SRL) (H1: β = 0.444; ρ = 0.000; t = 7.007), indicating that stronger pedagogical understanding is associated with more developed learning regulation strategies among students. PCK also demonstrates a substantial direct effect on Teaching Readiness (TR) (H2: β = 0.406; ρ = 0.000; t = 5.000), suggesting that pedagogical competence is closely linked to students' perceived preparedness for teaching.

Similarly, Prior Knowledge (PK) exhibits a strong and significant positive effect on SRL (H3: β = 0.497; ρ = 0.000; t = 7.644), representing the highest coefficient among the direct relationships. This indicates that students' existing knowledge base plays a dominant role in shaping their ability to regulate their own learning processes. Furthermore, PK also has a positive and significant effect on TR (H4: β = 0.211; ρ = 0.014; t = 2.475); however, the relatively smaller magnitude of this effect suggests that prior knowledge contributes to teaching readiness to a lesser extent when compared to pedagogical competence and regulatory processes.

Moreover, Self-Regulated Learning (SRL) significantly influences Teaching Readiness (TR) (H5: $\beta = 0.240$; $\rho = 0.008$; $t = 2.683$). This finding indicates that students who are more capable of managing and regulating their learning processes tend to demonstrate higher levels of readiness to teach. Nevertheless, the moderate size of this coefficient suggests that SRL operates as an important, yet not exclusive, contributor to teaching readiness.

For the indirect effects, the results reveal that SRL acts as a significant mediating mechanism in the relationship between PCK and TR (H6: $\beta = 0.107$; $\rho = 0.022$; $t = 2.306$). This indicates that pedagogical knowledge enhances teaching readiness not only directly but also indirectly through its influence on students' self-regulation. Likewise, SRL mediates the relationship between PK and TR (H7: $\beta = 0.119$; $\rho = 0.008$; $t = 2.659$), suggesting that prior knowledge contributes to readiness partly through the development of effective learning regulation processes. However, the relatively modest magnitude of these indirect effects indicates that the mediating role of SRL is partial rather than dominant. All hypotheses (H1–H7) are statistically supported. However, this uniform significance should be interpreted with consideration of the relative effect sizes and the potential influence of sample characteristics. The findings indicate that PCK and PK function as key determinants of SRL and Teaching Readiness, both directly and indirectly, but with differentiated roles. Prior Knowledge shows the strongest influence on SRL, while Pedagogical Content Knowledge demonstrates a more substantial direct contribution to Teaching Readiness. These patterns suggest that cognitive, pedagogical, and self-regulatory factors operate in a complementary rather than interchangeable manner in shaping students' readiness to become early childhood educators.

The findings of this study provide empirical evidence that pedagogical, cognitive, and metacognitive factors jointly contribute to teaching readiness among early childhood teacher education students. More importantly, the results extend existing understanding by showing that the contribution of knowledge to teaching readiness is not automatic, but contingent upon internal regulatory processes. The significant positive relationship between Pedagogical Content Knowledge (PCK) and Self-Regulated Learning (SRL) indicates that students with stronger pedagogical understanding tend to exhibit more developed learning regulation strategies. This aligns with contemporary research highlighting that professional knowledge enhances metacognitive awareness and strategic learning behaviors among pre-service teachers (König et al., 2022; Lauermann & ten Hagen, 2021; Panadero, 2022). At the same time, the direct influence of PCK on Teaching Readiness (TR) confirms that pedagogical competence plays a central and more immediate role in shaping professional preparedness. Pre-service teachers who are capable of transforming subject matter into meaningful instruction are more confident and better prepared for classroom practice (König et al., 2022; Guerriero, 2021; Darling-Hammond et al., 2020). This suggests that while prior knowledge operates as a cognitive foundation, PCK represents applied knowledge that is more directly aligned with teaching performance. This finding supports the view that PCK is a foundational domain of teacher professionalism, particularly in early childhood education where instructional sensitivity and adaptability are essential (Guerriero, 2021; Ulferts, 2021; König et al., 2022).

In addition, the results demonstrate that Prior Knowledge (PK) has the strongest effect on SRL, suggesting that students' existing knowledge base significantly enhances their ability to regulate learning processes. This is consistent with cognitive theories emphasizing that prior knowledge facilitates deeper information processing, goal setting, and monitoring strategies (Simonsmeier et al., 2021; Schneider & Preckel, 2022; Panadero, 2022). Students with richer prior knowledge are more likely to engage in planning, monitoring, and reflection, which are essential components of self-regulated learning (Panadero, 2022; Broadbent & Poon, 2021; Dent & Koenka, 2022). However, although the direct effect of Prior Knowledge on Teaching Readiness is statistically significant, its relatively smaller magnitude indicates that knowledge alone is insufficient to ensure readiness for teaching.

This finding challenges linear assumptions that equate knowledge acquisition with professional competence and reinforces the notion that teaching readiness is a multidimensional construct requiring the integration of knowledge, pedagogical competence, and self-regulation skills (Darling-Hammond et al., 2020; OECD, 2021; Guerriero, 2021). Furthermore, the significant relationship between Self-Regulated Learning and Teaching Readiness indicates that students who actively manage their learning processes are more prepared to face the complexities of teaching practice. Self-regulated learners demonstrate higher adaptability, reflective capacity, and continuous improvement, which are essential characteristics of effective teachers (Panadero, 2022; Dent & Koenka, 2022; Zheng et al., 2023). In this study, SRL should not be interpreted merely as a statistical mediator, but as a transformative mechanism that enables students to convert knowledge into context-sensitive pedagogical actions through processes such as planning, monitoring, and reflection. This finding is particularly important in early childhood education, where teaching requires responsiveness,

flexibility, and ongoing professional learning (OECD, 2021; Zheng et al., 2023; Lauermann & ten Hagen, 2021).

The mediation analysis further supports this interpretation. The significant indirect effect of PCK on Teaching Readiness through SRL suggests that pedagogical knowledge enhances readiness not only directly but also by fostering students' capacity for self-regulation. Similarly, SRL mediates the relationship between Prior Knowledge and Teaching Readiness, indicating that knowledge contributes to readiness through regulatory processes rather than through direct transfer alone. However, the relatively moderate magnitude of these indirect effects suggests that SRL operates as a partial rather than dominant mechanism, indicating that other contextual or experiential factors may also play an important role. Importantly, the finding that all hypotheses are statistically supported should not be interpreted as unqualified confirmation of a fully comprehensive model. The uniformly positive relationships may reflect a relatively homogeneous perception among respondents, which is influenced by the fact that most participants are early-stage pre-service teachers with limited teaching and practicum experience. In such contexts, self-reported measures may capture perceived readiness rather than fully developed professional competence. Therefore, the results should be interpreted with caution, particularly in relation to their generalizability and explanatory scope.

From a broader contextual perspective, the findings should also be interpreted within the structural characteristics of teacher education in Indonesia. The predominance of early-semester students with limited exposure to practicum experiences suggests that professional readiness is still largely shaped by theoretical instruction rather than experiential learning. In such conditions, self-regulated learning may function as a compensatory mechanism that helps students bridge the gap between conceptual knowledge and practical application. This highlights the importance of institutional design, particularly the integration of practicum experiences and reflective learning opportunities, in shaping how knowledge is transformed into readiness. Overall, this study contributes to the literature by demonstrating that teaching readiness is not merely the outcome of knowledge acquisition, but the result of a dynamic interaction between cognitive resources, pedagogical competence, and self-regulatory processes. These findings extend existing frameworks by emphasizing that the effectiveness of knowledge in shaping professional readiness depends on the extent to which it is actively regulated, reflected upon, and adapted to real teaching contexts.

Despite the explanatory strength of the model, several limitations should be considered when interpreting the findings. The demographic composition of the sample, which is overwhelmingly dominated by female respondents, may limit the generalizability of the results, particularly in capturing potential gender-based differences in teaching readiness and learning regulation. Although this distribution reflects the typical profile of early childhood teacher education, it may also reduce variability and influence the observed relationships among variables. In addition, it is important to acknowledge that other variables not included in this study may also influence teaching readiness. Factors such as institutional support, practicum exposure, teaching experience, and learning environment could play significant roles in shaping students' readiness to teach. The omission of these variables may limit the comprehensiveness of the model and suggests that teaching readiness should be understood as a multidimensional construct influenced by both individual and contextual factors. Future studies are encouraged to incorporate these variables and consider more balanced samples using longitudinal or mixed-method approaches to better capture the complexity and developmental nature of teaching readiness.

Conclusions

This study demonstrates that teaching readiness among early childhood teacher education students is not a direct outcome of knowledge acquisition, but emerges through the interaction of cognitive, pedagogical, and metacognitive processes. While Prior Knowledge (PK) provides a foundational cognitive base and Pedagogical Content Knowledge (PCK) directly supports instructional preparedness, their contributions to teaching readiness are contingent upon Self-Regulated Learning (SRL). The findings show that prior knowledge has the strongest influence on SRL, highlighting its role in shaping students' capacity to plan, monitor, and regulate their learning processes, whereas PCK exerts a more immediate effect on teaching readiness due to its closer alignment with practical teaching competencies. Importantly, SRL functions as a mediating mechanism that enables the transformation of knowledge into professional readiness, rather than acting merely as an additional predictor. This indicates that the effectiveness of knowledge in preparing students for teaching depends on their ability to actively regulate and adapt their learning processes. From a theoretical perspective, this study advances the literature by challenging linear assumptions that equate knowledge acquisition with readiness, and instead proposes a mechanism-based explanation in which teaching readiness is understood as a dynamic and mediated construct. From a practical perspective, the findings suggest that teacher education programs should not only emphasize the development of content and pedagogical knowledge, but also systematically foster self-regulated learning skills to support the transition from knowledge to professional competence. This

study provides a more integrative and theoretically grounded account of teaching readiness, offering important implications for future research and the design of teacher education practices.

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