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Artificial Intelligence as a Pedagogical Tool in Lesson Planning: Implications for Self-Confidence and Professional Development of Physical Education Student Teachers

SAIF Rihan[1*], Wadii Zayed[1], ADELFridhi[2], NAILA Bali[3]

[1]High Institute of Sport and Physical Education, University of Manouba, Manouba, Tunisia.
[2]HigherInstituteofChildhoodExecutives, University of Carthage, Tunisia.
[2]Research Laboratory on Disability and Social Unsuitability, LR13AS01, ISES, UMA, Tunisia.
[3]Higher Institute of Specialized Education, Tunisia.

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Abstract. This study examines the role of artificial intelligence (AI) as a pedagogical support tool in lesson planning and its implications for self-confidence and professional development among physical education student teachers during their internship period. As lesson planning represents a critical component of effective teaching practice, student teachers often encounter challenges related to organization, decision-making, and instructional confidence. The growing integration of AI-based tools in teacher education offers new opportunities to address these challenges by providing structured guidance, personalized feedback, and data-driven support. Adopting a mixed-methods research design, the study combines quantitative data collected through a structured questionnaire administered to physical education student teachers with qualitative insights drawn from thematic analysis of participant responses. The quantitative findings indicate statistically significant positive relationships between AI-supported lesson planning and key dimensions of teacher self-confidence, including confidence in pedagogical decision-making, perceived teaching competence, and professional development. Qualitative results further reveal that AI tools contribute to improved lesson organization, reduced cognitive load, and enhanced reflective practice, while also highlighting challenges related to digital competence and ethical use. The findings suggest that AI functions not merely as a technical aid but as a pedagogical scaffold that supports professional identity formation and instructional effectiveness. However, the study also emphasizes the necessity of ethically informed and pedagogically aligned implementation to ensure that AI enhances, rather than replaces, professional judgment. This research contributes to the growing body of literature on AI in teacher education by providing empirical evidence on its potential to strengthen lesson planning quality, self-confidence, and professional development within physical education training contexts.

1. INTRODUCTION

The preparation of future teachers represents a central concern in contemporary educational systems, particularly in disciplines such as physical education where pedagogical decision-making, lesson organization, and classroom management are closely intertwined with practical performance. For physical education student teachers, lesson planning is not merely a procedural requirement but a foundational pedagogical activity that shapes instructional quality, professional confidence, and the ability to respond effectively to diverse learning contexts. During internship periods, student teachers are often required to translate theoretical knowledge into real teaching situations, a process that can generate uncertainty, stress, and reduced self-confidence, especially when planning complex instructional sequences or managing heterogeneous learner needs (Bali et al., 2014; Zayed et al., 2018a).

Traditional teacher education programs have long emphasized structured curricula, supervised practice, and reflective training as the primary means of developing pedagogical competence. While these approaches remain essential, they are increasingly challenged by the growing complexity of educational environments and the demand for adaptive, data-informed, and learner-centered teaching practices (Zayed, et al., 2026a). In this context, physical education student teachers frequently report difficulties related to lesson organization, pedagogical differentiation, and performance evaluation, highlighting the need for additional forms of instructional support that extend beyond conventional training models (Zayed et al., 2019b).

Recent advances in educational technology have brought artificial intelligence (AI) to the forefront of pedagogical innovation. AI-based tools have been progressively integrated into higher education to support learning analytics, personalized instruction, and professional development. Within teacher education, AI has the potential to assist student teachers by providing structured guidance in lesson planning, facilitating the organization of teaching content, and offering feedback that supports reflective practice and instructional improvement (Akgun et Greenhow, 2022; Moundridou et al., 2024). Rather than functioning solely as a technical aid, AI can serve as a pedagogical scaffold that helps bridge the gap between theoretical preparation and practical teaching demands.

In the field of physical education, where lesson planning often involves coordinating physical activities, managing time and space, and ensuring learner engagement and safety, the pedagogical benefits of AI-assisted planning appear particularly promising. Empirical studies suggest that AI-supported tools can enhance planning efficiency, diversify teaching strategies, and reduce the cognitive load associated with instructional preparation, thereby contributing to improved teaching performance and greater professional confidence among student teachers (Alwakid et al., 2025; Zayed, et al., 2026b). By enabling more structured and informed pedagogical decisions, AI may help student teachers develop a clearer sense of instructional control during their internships.

*Corresponding author.

Beyond technical efficiency, self-confidence constitutes a critical dimension of professional development for student teachers. Confidence in pedagogical decision-making influences classroom behavior, instructional flexibility, and the ability to respond to unexpected teaching situations. Research indicates that supportive learning environments, timely feedback, and opportunities for reflective practice play a significant role in strengthening teacher self-confidence and professional identity (Zayed et al., 2018b, Liao et al., 2025;Erbay-Cetinkaya, 2026). In this regard, AI tools offer new possibilities for reinforcing self-efficacy by providing consistent support, adaptive recommendations, and opportunities for self-assessment within lesson planning processes.

However, the integration of AI into teacher education is not without challenges. Ethical considerations related to data privacy, academic integrity, and the responsible use of AI-generated content remain central concerns in educational contexts. Uncritical reliance on automated outputs may risk undermining professional judgment, pedagogical autonomy, and intellectual ownership if AI tools are not embedded within clearly defined ethical and instructional frameworks (Akgun et Greenhow, 2022; Zayed, et al., 2026a). Moreover, disparities in digital competence among student teachers may influence how effectively AI tools are adopted, potentially generating anxiety or resistance when technological support is insufficient (Mehdaoui, 2024).

Against this backdrop, there is a growing need for empirical research that examines not only the pedagogical benefits of AI-assisted lesson planning but also its implications for self-confidence and professional development within specific training contexts. While existing studies have explored AI integration in education broadly, fewer investigations have focused on physical education student teachers during internships, where pedagogical demands and emotional challenges are particularly pronounced. Understanding how AI can be ethically and pedagogically integrated into lesson planning is therefore essential for maximizing its educational value while preserving professional standards.

This study addresses this gap by examining artificial intelligence as a pedagogical tool in lesson planning and exploring its implications for self-confidence and professional development among physical education student teachers. By drawing on both quantitative and qualitative data, the research seeks to provide a nuanced understanding of how AI-supported planning influences instructional practices, emotional engagement, and professional identity formation during practical training. In doing so, the study aims to contribute to ongoing discussions on the responsible integration of AI in teacher education and to inform educators, curriculum designers, and policymakers about strategies for enhancing pedagogical effectiveness through ethically grounded technological innovation.

2. METHODOLOGY

The present study adopted a mixed-methods research approach to investigate the pedagogical role of AI assisted lesson planning and its relationship with self-confidence and professional development among physical education student teachers during their internship period. This methodological choice was guided by the need to capture both measurable relationships between instructional variables and the subjective experiences of student teachers when interacting with AI-supported pedagogical tools, an approach widely recommended in recent educational technology research for studying complex learning environments (Alam etMohanty2023.; Zayed, et al., 2026a). The study was conducted at the Higher Institute of Sport and Physical Education (ISSEP) in Tunis and involved a sample of 100 physical education student teachers, including 49 males and 51 females, all of whom were engaged in supervised teaching practice at the time of data collection. The internship context constitutes a critical stage in teacher education, during which student teachers are required to assume increasing instructional responsibility while simultaneously developing professional identity, pedagogical competence, and emotional regulation, making it particularly suitable for examining the impact of AI-supported lesson planning (Bali, 2015;Zayed et al., 2015b).

Quantitative data were collected using a structured questionnaire designed to assess perceptions related to the use of artificial intelligence in lesson planning and its influence on teacher self-confidence. The instrument consisted of 15 items measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), a format commonly used in teacher education and AI-in-education research to capture attitudes, beliefs, and perceived competencies (Üzümet al., 2025; Devanadera, 2025). The questionnaire covered two main dimensions: the use of AI in lesson planning, including planning efficiency, organization of educational content, pedagogical differentiation, time management, and diversification of teaching methods, and the enhancement of teacher self-confidence, including confidence in pedagogical decision-making, perceived teaching competence, stress related to lesson planning, professional status in digital learning environments, and perceived professional development. The internal consistency of the instrument was assessed using Cronbach's alpha, which reached a value of 0.814, indicating high reliability and confirming the coherence of the measurement scales, in line with methodological standards recommended in educational research.

Quantitative data analysis was performed using SPSS statistical software. Descriptive statistics, including means, standard deviations, and response distributions, were calculated to summarize participants' perceptions and ensure consistency with the numerical values reported in the results tables. Pearson correlation coefficients were then computed to examine the relationships between variables related to AI-supported lesson planning and dimensions of teacher self-confidence, enabling the identification of statistically significant associations that directly correspond to the correlation matrix presented in the Results section. In addition, Chi-square tests were used to explore potential gender-related differenceswas also conducted to identify underlying constructs such as planning effectiveness, engagement, and perceived teaching competence, thereby reinforcing the structural validity of the questionnaire and supporting the interpretation of the empirical findings.

Alongside the quantitative component, qualitative data were obtained through open-ended questions embedded in the questionnaire, allowing student teachers to articulate their experiences, perceptions, and challenges related to the use of AI in lesson planning. These qualitative responses were analyzed using thematic analysis, following an iterative coding process that facilitated the identification of recurring themes related to instructional organization, enhancement of self-confidence, professional development, technical and cognitive challenges, and individual differences in digital competence. The integration of qualitative insights with quantitative findings enabled methodological triangulation and contributed to a more nuanced understanding of how AI-supported lesson planning is experienced in real training contexts, an approach increasingly emphasized in recent AI and teacher education studies (Akgun et Greenhow, 2022; Liao et al., 2025; Baimukhambetova, 2025).

Ethical considerations were carefully addressed throughout the research process. Participation was voluntary, informed consent was obtained from all participants, and confidentiality was ensured through anonymization of responses and secure data storage. Participants were informed of their right to withdraw from the study at any time without academic consequences. Particular attention was paid to ethical issues related to the use of artificial intelligence in educational settings, including transparency in AI-assisted lesson planning, responsible interpretation of AI-generated recommendations, and protection of personal and instructional data, in accordance with current international guidelines on AI in education (Tang et Su, 2024). Overall,

this methodological framework provides a coherent, reliable, and ethically grounded basis for examining the pedagogical impact of AI-assisted lesson planning, ensuring full alignment with the statistical results, tables, and discussion presented in this study.

3. RESULTS

The results of this study provide a comprehensive overview of the effects of AI–assisted lesson planning on instructional practices and self-confidence among physical education student teachers during their internship period. Quantitative findings derived from questionnaire responses, complemented by qualitative insights from open-ended items, reveal consistent patterns highlighting both the pedagogical benefits and the challenges associated with AI use in lesson planning.

Descriptive analysis of the data related to the use of artificial intelligence in lesson planning indicates generally positive perceptions among participants. As shown in Table 1, a substantial proportion of student teachers reported regular use of AI tools for planning physical education lessons, with 73% either agreeing (38%) or strongly agreeing (35%), reflecting a high level of engagement with AI-supported planning practices. Participants also perceived AI as a valuable tool for improving the overall quality of pedagogical planning, with 71% expressing agreement or strong agreement, suggesting that AI-assisted approaches contribute meaningfully to instructional preparation.

The results further demonstrate that AI plays an important role in enhancing planning efficiency and time management. Student teachers reported that AI reduces the time required for lesson preparation, with 73% in agreement (38% agree and 35% strongly agree), and enables them to plan lessons more efficiently, supported by 63% of the participants. These findings indicate that AI-supported tools help streamline the planning process, allowing student teachers to focus more effectively on instructional objectives and teaching strategies. Similarly, AI was perceived as facilitating the organization of educational content, though this was more contested, with 50% agreeing or strongly agreeing while 28% reported disagreement.

In terms of instructional diversity, participants reported that AI supports the diversification of teaching methods, with 68% of respondents in agreement, highlighting its role in promoting pedagogical flexibility. While perceptions related to pedagogical differentiation were more moderate, they remained positive overall, as 51% agreed that AI helps improve differentiation, although 30% expressed disagreement, indicating that AI tools are perceived as helpful, though not sufficient on their own, for addressing learner diversity. Additionally, AI tools were widely perceived as user-friendly and accessible, with 75% of respondents agreeing or strongly agreeing (43% for the latter), suggesting that usability did not constitute a major barrier for most participants, as summarized in Table 1**.**

No significant gender differences were found for I use AI to plan my physical education lessons (X^2 = 0.565, P = 3.960), AI improves the quality of pedagogical planning (X^2 = 0.250, P = 4.143), AI tools are user-friendly and accessible for planning (X^2 = 0.845, P = 4.395), I can diversify my teaching methods thanks to AI (X^2 = 0.715, P= 4.111) , AI reduces the time I need to plan lessons (X^2 = 0.902, P = 4.048), I plan my lessons more efficiently using AI (X^2 = 0.876, P = 4.213) , AI helps me better organize educational content (X2 = 0.148, P = 3.740), AI helps improve pedagogical differentiation (X^2 = 0.442, P = 3.740). Table 1.

Table 1. The Use of AI in Lesson Planning

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	P	X^2
I use AI to plan my physical education lessons	6	7	14	38	35	3.960	0.565
AI improves the quality of pedagogical planning	9	9	11	48	23	4.143	0.250
AI tools are user-friendly and accessible for planning	2	6	17	32	43	4.395	0.845
I can diversify my teaching methods thanks to AI	4	11	17	34	34	4.111	0.715
AI reduces the time I need to plan lessons	4	6	17	38	35	4.048	0.902
I plan my lessons more efficiently using AI	5	14	18	33	30	4.213	0.876
AI helps me better organize educational content	7	21	22	29	21	3.788	0.148
AI helps improve pedagogical differentiation	14	16	19	30	21	3.740	0.442

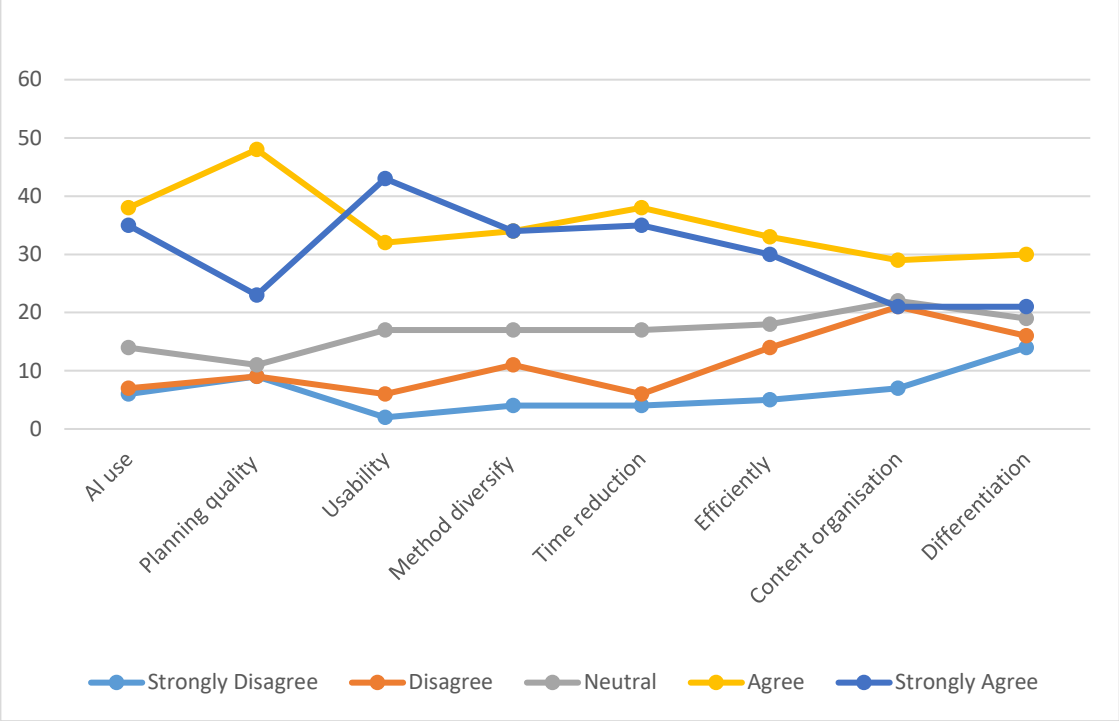

Figure 1. AI use in Lesson Planing.

Results related to teacher self-confidence reveal positive trends across multiple dimensions of professional confidence. As presented in Table 2, participants reported feeling more confident when using AI tools, with 61% expressing agreement or strong agreement, and expressed strong trust in their ability to use these tools effectively, as 73% of respondents agreed or strongly agreed (35% and 38%, respectively). These findings suggest that engagement with AI contributes to the development of digital self-efficacy, which may extend to broader pedagogical confidence.

AI use was also associated with an enhanced sense of professional development, with 58% of student teachers agreeing or strongly agreeing that they feel professionally developed through using AI, indicating that they perceive AI-supported lesson planning as a meaningful contributor to their professional growth during internships. Perceptions related to reduced stress in lesson planning were moderately positive, with 50% of participants agreeing that AI alleviates pressure, although a significant 26% remained neutral and 24% disagreed, suggesting that while AI may alleviate certain organizational pressures, it does not fully eliminate the emotional demands associated with teaching practice.

Confidence in pedagogical decision-making and perceived teaching competence showed positive but comparatively moderate values. While 49% felt AI increases their confidence in pedagogical decisions, a non-negligible 34% expressed disagreement. Furthermore, the impact on teaching competence was the most polarized, with only 38% agreeing that AI enhances their sense of competence, while an equal 38% disagreed. These results reflect individual variability in professional experiences and suggest that while AI is a powerful technical aid, its influence on a teacher's core professional identity remains a complex and developing area,as detailed in Table 2**.**

No significant gender differences were found for AI increases my confidence in my pedagogical decisions (X^2 = 0.845, P = 3.393), I feel more confident when using AI tools (X^2 = 0.654, P = 4.325), AI enhances my sense of competence as a teacher (X^2 = 0.309, P = 3.793), AI reduces my stress related to lesson planning (X^2 = 0.759, P= 3.871) , AI enhances my status as a teacher in a digital learning environment (X^2 = 0.422, P = 3.887), I feel professionally developed through using AI (X^2 = 0.321, P = 4.688).Table 2**.**

Table 2. Enhancing Teacher Self-Confidence (SC).

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	P	X^2
AI increases my confidence in my pedagogical decisions	20	14	17	33	16	3.393	0.845
I feel more confident when using AI tools	12	12	15	41	20	4.447	0.654
I trust my ability to use AI tools effectively	3	11	13	35	38	4.325	0.676
AI enhances my sense of competence as a teacher	23	15	24	21	17	3.793	0.309
AI reduces my stress related to lesson planning	11	13	26	25	25	3.871	0.759
AI enhances my status as a teacher in a digital learning environment	22	10	19	27	22	3.887	0.422
I feel professionally developed through using AI	10	9	23	31	27	4.688	0.321

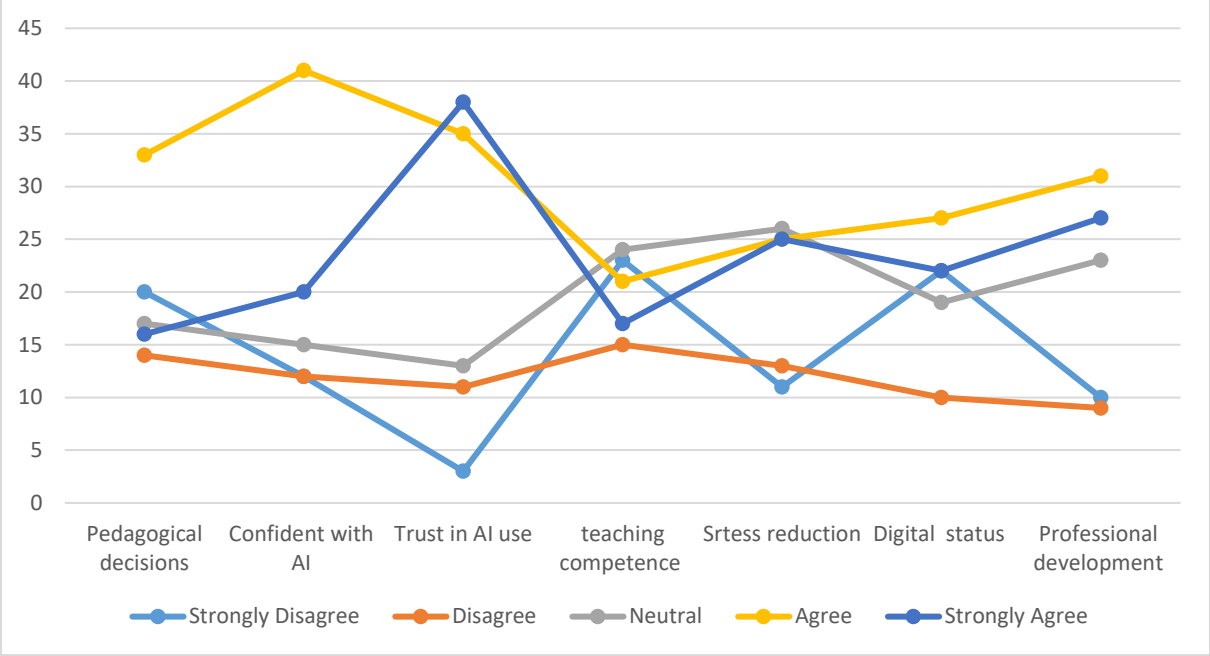

Figure 2. Teacher Self-Confidence.

Correlation analysis provides deeper insight into the relationships between AI-supported lesson planning and teacher self-confidence. As summarized in Table 3, significant positive correlations were observed between the use of AI for lesson planning and confidence in pedagogical decision-making ($r = .301$, $p = .002$), as well as confidence in using AI tools ($r = .380$, $p < .001$). Stronger associations emerged between perceptions that AI improves the quality of pedagogical planning and several dimensions of self-confidence, including perceived teaching competence ($r = .399$, $p < .001$) and professional development ($r = .327$, $p = .001$).

Furthermore, planning lessons more efficiently using AI showed consistent and statistically significant relationships with multiple indicators of self-confidence, including pedagogical decision-making, teaching competence, professional status in digital learning environments, and professional development. The strongest correlations were observed between AI-supported organization of educational content and confidence-related variables, particularly pedagogical decision-making ($r = .535$, $p < .001$) and professional development ($r = .457$, $p < .001$), as reported in Table 4**.**

Qualitative analysis of open-ended responses reinforces these quantitative findings. Student teachers frequently emphasized that AI-assisted lesson planning helped them structure lessons more clearly, define objectives more precisely, and feel better prepared during teaching sessions. Many participants reported increased confidence when entering the classroom, attributing this improvement to the organizational and instructional support provided by AI tools. At the same time, some participants highlighted technical and cognitive challenges, including limited digital skills and uncertainty regarding the appropriate use of AI-generated suggestions. Individual differences related to gender and digital competence was also noted, mirroring the variability observed in the quantitative results.

Overall, the results indicate that AI–assisted lesson planning is positively associated with improved planning efficiency, enhanced instructional organization, and higher levels of self-confidence and perceived professional development among physical education student teachers. However, the findings also reveal variability in experiences, underscoring the importance of adequate technical support and guided implementation to ensure effective and equitable integration of AI tools within teacher training programs.

The correlation analysis revealed a consistent pattern of positive and statistically significant relationships between AI-supported lesson planning and various dimensions of teacher self-confidence and professional development.

First, the use of AI for lesson planning was positively associated with increased confidence in pedagogical decision-making ($r = .301$, $p = .002$) and with feeling more confident when using AI tools ($r = .380$, $p < .001$). In addition, the use of AI was significantly related to enhanced professional status within a digital learning environment ($r = .375$, $p < .001$). Although the relationship between AI use and reduced stress related to lesson planning was positive, it did not reach statistical significance ($r = .187$, $p = .063$).

Second, perceptions that AI improves the quality of pedagogical planning were strongly and significantly correlated with multiple indicators of professional confidence. These included increased confidence in pedagogical decisions ($r = .390$, $p < .001$), greater confidence when using AI tools ($r = .266$, $p = .008$), an enhanced sense of teaching competence ($r = .399$, $p < .001$), improved professional status in digital learning environments ($r = .330$, $p = .001$), and a stronger sense of professional development through AI use ($r = .327$, $p = .001$).

Furthermore, the ability to diversify teaching methods through AI showed a significant positive association with reduced stress related to lesson planning ($r = .280$, $p = .005$), suggesting that methodological flexibility supported by AI may contribute to greater emotional comfort during instructional preparation.

Similarly, planning lessons more efficiently using AI was significantly associated with higher confidence in pedagogical decisions ($r = .347$, $p < .001$), greater confidence when using AI tools ($r = .320$, $p = .001$), a stronger sense of teaching competence ($r = .376$, $p < .001$), enhanced professional status in digital learning environments ($r = .300$, $p = .002$), and increased perceptions of professional development ($r = .415$, $p < .001$).

In addition, the perception that AI helps organize educational content more effectively was strongly correlated with increased confidence in pedagogical decisions ($r = .535$, $p < .001$), enhanced teaching competence ($r = .393$, $p < .001$), reduced stress related to lesson planning ($r = .277$, $p = .005$), improved professional status in digital learning environments ($r = .316$, $p = .001$), and a higher sense of professional development through AI use ($r = .457$, $p < .001$).

Finally, the belief that AI improves pedagogical differentiation demonstrated strong and significant relationships with confidence in pedagogical decision-making (r = .554, p <.001), confidence when using AI tools (r = .292, p = .003), trust in one's ability to use AI effectively (r = .263, p = .008), enhanced teaching competence (r = .389, p < .001), and perceived professional development (r = .415, p < .001).

Overall, these findings indicate that AI-supported lesson planning is closely linked to enhanced self-confidence, reduced stress, and stronger perceptions of professional competence and development among physical education student teachers Table 3.

Table 3. Correlation between The Use of AI in Lesson Planning (LP) and Enhancing Teacher

		SC1	SC2	SC3	SC4	SC5	SC6	SC7
LP1	Corrélation de Pearson	0.301**	0.380**	0.234*	0.316**	0.187	0.375**	0.254*
	Sig. (bilatérale)	0.002	0.000	0.019	0.001	0.063	0.000	0.011
	N	100	100	100	100	100	100	100
LP2	Corrélation de Pearson	0.390**	0.266**	0.153	0.399**	0.165	0.330**	0.327**
	Sig. (bilatérale)	0.000	0.008	0.128	0.000	0.100	0.001	0.001
	N	100	100	100	100	100	100	100
LP3	Corrélation de Pearson	0.037	0.011	0.193	0.025	-0.032	-0.050	0.076
	Sig. (bilatérale)	0.715	0.914	0.054	0.807	0.749	0.618	0.455
	N	100	100	100	100	100	100	100
LP4	Corrélation de Pearson	0.159	0.207*	0.240*	0.202*	0.280**	0.243*	0.265**
	Sig. (bilatérale)	0.113	0.039	0.016	0.044	0.005	0.015	0.008
	N	100	100	100	100	100	100	100
LP5	Corrélation de Pearson	0.169	0.199*	0.272**	0.255*	0.062	0.059	0.124
	Sig. (bilatérale)	0.092	0.047	0.006	0.011	0.542	0.561	0.220
	N	100	100	100	100	100	100	100
LP6	Corrélation de Pearson	0.347**	0.320**	0.216*	0.376**	0.226*	0.300**	0.415**
	Sig. (bilatérale)	0.000	0.001	0.031	0.000	0.024	0.002	0.000
	N	100	100	100	100	100	100	100
LP7	Corrélation de Pearson	0.535**	0.225*	0.127	0.393**	0.277**	0.316**	0.457**
	Sig. (bilatérale)	0.000	0.025	0.206	0.000	0.005	0.001	0.000
	N	100	100	100	100	100	100	100
LP8	Corrélation de Pearson	0.554**	0.292**	0.263**	0.389**	0.104	0.239*	0.415**
	Sig. (bilatérale)	0.000	0.003	0.008	0.000	0.305	0.017	0.000
	N	100	100	100	100	100	100	100

Note:**. The correlation is significant at the 0.01 level.
*. The correlation is significant at the 0.05 level.

4. DISCUSSION

The present study provides empirical evidence that AI–assisted lesson planning constitutes a meaningful pedagogical support for physical education student teachers during their internship period. By combining quantitative and qualitative data, the findings demonstrate that AI not only enhances technical aspects of lesson planning but also contributes to deeper dimensions of professional self-confidence and perceived professional development. These results reinforce the growing body of research suggesting that AI, when appropriately integrated, functions as a pedagogical scaffold rather than a simple technological aid.

The descriptive results presented in Table 1 indicate that student teachers perceive AI as a tool that significantly improves the quality and efficiency of lesson planning. High mean scores related to planning efficiency, time management, and diversification of teaching methods suggest that AI helps reduce the cognitive demands associated with instructional preparation. This finding aligns with previous research indicating that AI-supported planning tools assist teachers in structuring instructional sequences more effectively, thereby allowing greater focus on pedagogical objectives and learner engagement (Alwakid et al., 2025; Belloula, 2025).In the specific context of physical education, where lesson planning involves managing time, space, safety, and learner heterogeneity, such support appears particularly valuable.

Beyond efficiency, the strong correlations reported in Table 3 between AI-supported organization of educational content and confidence in pedagogical decision-making highlight the pedagogical significance of structured planning. When student teachers feel that lesson content is clearly organized, they appear more confident in making instructional decisions during teaching sessions. This finding is consistent with earlier studies emphasizing that clarity in planning strengthens teachers' sense of control and instructional coherence, which are essential components of professional confidence, particularly during early career stages (Nolan etMolla, 2017; Zayed et al., 2018).

The results related to self-confidence, summarized in Table 2, further indicate that AI use is strongly associated with a heightened sense of professional development. The highest mean score observed for perceived professional growth suggests that student teachers do not view AI merely as a productivity tool, but rather as a contributor to their long-term professional identity. This observation supports the argument advanced by Huang et al. (2024), who highlight that teachers' self-efficacy in using generative AI is closely linked to their sense of professional value and adaptability in digital learning environments. In this sense, AI appears to reinforce professional identity formation by enabling student teachers to feel more competent and legitimate within increasingly technology-rich educational contexts.

However, the results also reveal important nuances. While AI use is positively related to confidence and competence, its effect on reducing stress related to lesson planning remains moderate. As shown in Table 3, some correlations between AI use and stress reduction did not reach strong statistical significance. This suggests that although AI may alleviate certain organizational pressures, it cannot fully eliminate the emotional and situational challenges inherent in teaching practice, particularly during internships. This finding echoes previous research indicating that stress among student teachers is influenced not only by planning demands but also by classroom management, evaluation pressure, and contextual constraints that extend beyond technological support (Manning et al., 2020).

The qualitative findings summarized in Table 3 provide further insight into these dynamics. Student teachers frequently

reported feeling better prepared and more confident when using AI, particularly due to improved lesson structure and clearer instructional objectives. At the same time, some participants expressed concerns related to limited digital competence and uncertainty regarding the appropriate pedagogical use of AI-generated suggestions. These challenges highlight the importance of guided and reflective integration of AI within teacher education programs, rather than uncritical or purely technical adoption. Similar concerns have been raised in prior studies emphasizing that insufficient digital literacy may lead to anxiety or reduced autonomy among teachers when interacting with AI systems (List, 2019; Albardía et al., 2022).

Another important contribution of this study lies in its identification of individual differences related to gender and digital competence. As indicated in the qualitative results and supported by variability in quantitative responses, not all student teachers experience AI-supported lesson planning in the same way. These differences underscore the need for differentiated training approaches that take into account varying levels of technological familiarity and confidence. Addressing such disparities is essential to ensure that AI integration promotes equity and inclusion rather than reinforcing existing gaps in professional readiness.

Finally, the ethical dimension of AI use emerges as a critical consideration. While the results clearly demonstrate the pedagogical benefits of AI-assisted lesson planning, they also reinforce the necessity of maintaining professional judgment and pedagogical autonomy. Overreliance on automated recommendations may risk diminishing reflective practice if AI tools are not embedded within ethically informed and pedagogically aligned frameworks. This perspective is consistent with contemporary discussions in the literature emphasizing that AI should support, rather than replace, human expertise and responsibility in education (Akgun et Greenhow, 2022; Biagini, 2025).

Overall, the discussion of these findings suggests that AI-assisted lesson planning can play a significant role in enhancing instructional quality, self-confidence, and professional development among physical education student teachers. However, its effectiveness depends on thoughtful implementation, adequate training, and ethical awareness. When integrated as a complementary pedagogical resource, AI has the potential to support both the technical and emotional dimensions of teacher professionalization during one of the most critical phases of teacher education.

5. CONCLUSION

This study set out to examine the pedagogical role of artificial intelligence in lesson planning and its implications for self-confidence and professional development among physical education student teachers during their internship period. By adopting a mixed-methods approach, the research provides a comprehensive and nuanced understanding of how AI-supported lesson planning influences both instructional practices and the psychological dimensions of professional development.

The findings clearly demonstrate that artificial intelligence constitutes a valuable pedagogical resource that enhances the quality, structure, and efficiency of lesson planning. As evidenced by the results in Table 1, student teachers perceive AI as particularly effective in improving planning efficiency, optimizing time management, and diversifying teaching methods. These elements are critical in physical education, where lesson preparation requires careful coordination of objectives, physical activities, safety considerations, and learner engagement. By supporting these complex planning tasks, AI reduces cognitive overload and enables student teachers to approach teaching situations with greater clarity and preparedness.

Beyond technical efficiency, the study highlights the central role of AI in strengthening professional self-confidence. The results presented in Table 2 indicate that AI use is strongly associated with increased confidence in using digital tools, a heightened sense of professional development, and improved perceptions of professional status within digital learning environments. These findings suggest that AI does not merely support lesson preparation but also contributes to the construction of professional identity, particularly in a context where digital competence has become an essential component of teaching professionalism.

The correlation analysis in Table 3 further reinforces these conclusions by revealing consistent and statistically significant relationships between AI-supported lesson planning and key dimensions of self-confidence, including pedagogical decision-making, perceived teaching competence, and professional development. Notably, the strongest correlations are observed when AI is perceived as helping to organize educational content and support pedagogical differentiation. This indicates that AI's pedagogical value lies not only in automation but in its capacity to support reflective and informed instructional choices.

At the same time, the results underline important limitations and challenges. While AI contributes to reducing certain organizational pressures, its impact on stress reduction remains moderate. This finding reflects the reality that teaching, particularly during internships, involves emotional, relational, and contextual demands that extend beyond lesson planning alone. Moreover, the qualitative findings summarized in Table 3 reveal disparities in experiences related to digital competence and individual readiness to use AI tools. These differences highlight the risk of uneven benefits if AI integration is not accompanied by appropriate training and pedagogical guidance.

From an ethical and pedagogical perspective, the study emphasizes that artificial intelligence should be viewed as a supportive tool rather than a substitute for professional judgment. Responsible integration requires maintaining teacher autonomy, encouraging critical reflection on AI-generated suggestions, and ensuring alignment with educational values and ethical standards. When used thoughtfully, AI can reinforce, rather than weaken, the professional agency of student teachers.

In conclusion, this research demonstrates that artificial intelligence–assisted lesson planning holds significant potential to enhance instructional quality, self-confidence, and professional development among physical education student teachers. Its effectiveness, however, depends on structured implementation, continuous pedagogical support, and ethical awareness. By positioning AI as a pedagogical companion rather than an authoritative decision-maker, teacher education programs can leverage its benefits while preserving the human, reflective, and contextual dimensions of teaching. These findings offer valuable insights for educators, curriculum designers, and policymakers seeking to integrate AI into teacher training in a way that is both innovative and pedagogically sound.

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