

## EVALUATING THE INFLUENCE OF ONLINE LEARNING ON THE PROFESSIONALISM OF IN-SERVICE TEACHER EDUCATION AT ISLAMIC HIGHER EDUCATION INSTITUTIONS

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Received: July, 2024. Accepted: September, 2024. Published: December, 2024.

### ABSTRACT

The growing importance of online learning in teacher education highlights the need to assess its impact on teacher professionalism. This study examines the effects of online learning within the in-service Teacher Professional Education (TPE) program at a State Islamic Higher Education institution in Indonesia. Using a mixed-methods approach, the research investigates online learning practices, curriculum adaptation, instructor preparation, and professionalism development. The quantitative analysis shows a significant, moderate correlation between online learning and teacher professionalism ( $R = 0.573$ ), accounting for 32.9% of the variance ( $R^2 = 0.329$ ), with a high statistical significance ( $p < 0.001$ ). Qualitative results support these findings, emphasizing the role of relevant course materials, learning tool development, and instructor feedback in enhancing professionalism. Curriculum adaptation and thorough preparation by lecturers and mentor teachers are also identified as critical to the program's success. While challenges such as limited interaction and internet access persist, online learning has proven to improve teacher professionalism by offering greater accessibility and flexibility. This study concludes that online learning, when implemented with the right strategies, can significantly elevate teacher professionalism. The implications for Islamic education emphasize the potential of online platforms to strengthen teacher development and educational quality.

Keywords: Cybergogy, Heutagogy, Peeragogy, Teacher Professional Development

### INTRODUCTION

The integration of online learning into higher education has become increasingly widespread, reshaping traditional methods of teaching and learning. This shift is particularly significant in teacher education, where institutions aim to equip future educators with the skills needed for national development and to meet the evolving demands of modern classrooms (Azaiki & Shotte, 2020; Teo et al., 2021; Skenderi & Skenderi, 2022). In countries like the United States, online learning has become a standard practice, with all 50 states offering K-12 online courses and some requiring students to complete at least one online class before graduating (Kennedy & Archambault, 2012; Larson & Archambault, 2015). Such policies have a profound impact on teacher education programs. In Indonesia, the rise of online learning, accelerated by the Covid-19 pandemic, has further emphasized its role in improving access and flexibility in education, particularly in teacher professional education programs (Mariyudi et al., 2021; Nurwidodo et al., 2023). This growing awareness of the benefits of online learning, along with technological advancements, has made it a critical component of teacher preparation and professional development (Quddus, 2019; Siregar et al., 2022).

In Indonesia, Teacher Professional Education (TPE) is mandated by Law No. 14/2005, requiring all teachers to obtain teaching certificates (Kusumawardhani, 2017). Despite this policy, over 1.5 million teachers remain uncertified, necessitating their

participation in the In-Service TPE program, where they face the dual roles of educators and students (Kommallasari, 2023). To address teacher shortages, State Islamic Higher Education (IHE) institutions launched online learning for in-service TPE in 2021, utilizing the SPACE Learning Management System for religious education (Siregar, 2023). However, concerns have emerged regarding the effectiveness of online learning in fostering teacher professionalism, particularly under the Ministry of Education, Culture, Research, and Technology (MECRT) and the Ministry of Religious Affairs (MoRA). A key challenge lies in the limited educational infrastructure and the older age of many participants, most of whom are Generation X teachers who are still adapting to digital technologies (Syafitri et al., 2024; Musthofa et al., 2023). These teachers must not only meet educational objectives but also achieve professional competencies through online platforms (Hanun, 2021). Ensuring the quality of education and meeting competency standards are essential to realizing the goal of teacher professionalism in Indonesia.

Professionalism in teacher education encompasses mastery of pedagogical techniques, subject matter expertise, personal ethics, interpersonal skills, and a commitment to continuous growth (Situmorang et al., 2022; Musthofa et al., 2023; Iqbal & Ali, 2024). These qualities are essential for teachers to navigate diverse classroom environments and school cultures, positively influence student outcomes, and guide students toward reaching their full potential (Helmi, 2015; Zaeni et al., 2018; Amtu et al., 2020). In the context of the in-service Teacher Professional Education (TPE) program, online learning has emerged as an innovative solution, significantly contributing to the development of professional competence. Studies indicate that it enhances teachers' pedagogical skills, technological proficiency, innovation, and collaborative practices (Musthofa et al., 2023; SA et al., 2021; Haryana et al., 2021), although challenges such as adapting to online platforms and meeting educational standards persist (Tri, 2020; Hanun, 2021).

However, online learning in Indonesia poses unique challenges compared to more technologically advanced countries like the United States, Finland, and Singapore (Kentnor, 2015; Kupiainen, 2019; Huang et al., 2022). Indonesian TPE participants face issues related to limited infrastructure, internet accessibility, and maintaining educational quality (Musthofa et al., 2023). To address these challenges, online learning in Indonesia draws on heutagogy, peeragogy, and cybergogy, which emphasize self-directed, collaborative, and technology-enhanced learning. Heutagogy fosters learner autonomy (Hase & Kenyon, 2000), allowing teachers to manage their learning and adapt to digital tools. Peeragogy promotes collaborative learning among educators, creating communities of practice (Corneli & Danoff, 2011). Cybergogy integrates digital tools to enhance learning experiences, particularly for Generation X teachers who face technological barriers in Indonesia's educational landscape (Wang & Hannafin, 2005).

Previous studies have highlighted the benefits of online learning, such as improved accessibility and flexibility (Kentnor, 2015; Kupiainen, 2019; Huang et al., 2022). However, there is limited research on the specific impact of online learning on teacher professionalism within Indonesia's State Islamic Higher Education (PTKIN) system. This study addresses this gap by exploring how heutagogy, peeragogy, and cybergogy can be effectively applied to enhance professionalism in this context. Focusing on the in-service Teacher Professional Education (TPE) program at State IHE institutions in Indonesia, this research examines the impact of online learning across four key areas: online learning evaluation, curriculum adaptation, instructor preparation, and its overall influence on professionalism. The novelty of this research lies in its focus on the PTKIN system, offering a comprehensive analysis of how these modern learning approaches contribute to teacher professionalism in an Islamic educational setting.

## METHOD

This study employed a mixed-methods approach, effectively combining qualitative and quantitative methodologies to explore complex issues surrounding online learning and teacher professionalism (Tavakoli & Azad, 2017; Julia et al., 2019). The qualitative aspect was crucial for understanding the perspectives of In-Service Teacher Professional Education (TPE) alumni regarding the influence of online learning on their professionalism. This approach allowed for an in-depth exploration of nuanced factors, such as feelings, thought processes, and emotions that traditional methods may overlook (Creswell, 2015). In contrast, the quantitative method facilitated a broader analysis of survey data, enabling a comprehensive understanding of alumni professionalism from both their perspectives and those of their users.

To gather data, purposive sampling was employed to select TPE alumni from Universitas Islam Negeri (UIN) K.H. Abdurrahman Wahid Pekalongan, recognized for producing top-ranking graduates from various Indonesian provinces. Out of 1,500 surveyed participants across seven batches (2021-2023), 327 individuals responded, representing various regions, including Central Java (270), East Java (17), and others. Survey responses indicated participation rates of 6.4% for 2021, 9.5% for 2022, and 37.5% for 2023, with all participants consenting to the research use of their data. Data collection methods included surveys, observations, interviews, and documentation, with the survey assessing the impact of online learning on graduate professionalism. Professionalism was evaluated across seven dimensions: integrity, expertise, English proficiency, IT mastery, communication, teamwork, and personal development. The study's data analysis involved iterative reading, coding based on the conceptual framework, and utilizing case and cross-case matrices to identify patterns and ensure analytical rigor. Quantitative data were analyzed using descriptive statistics and simple linear regression analysis to complement the qualitative insights, enhancing the overall validity of the research findings.

## RESULTS AND DISCUSSION

This study examined the impact of online learning on Teacher Professional Education (TPE) by gathering insights from a range of stakeholders, including managers, lecturers, mentor teachers, students, and administrators from relevant institutions. The findings revealed four key themes: (1) the evaluation of online learning aimed at preparing future teachers while identifying potential weaknesses in Teacher Professional Development (TPD), (2) the adaptation of TPE curricula by Islamic Higher Education (IHE) institutions in response to online learning modalities, (3) the preparation of instructors to deliver effective online learning that enhances TPD, and (4) the overall impact of online learning on the development of TPD.

### Theme one: online learning

This study found that evaluation of TPE program at the university was conducted through questionnaires. The results show satisfactory results in several aspects of online learning implementation, as shown in Table 1.

Table 1. Results of Questionnaire regarding Online TPE Program Learning Implementation (N: 327)

No	Statement No.	Percentage	
		Yes (1)	No (0)
1	X: Implementation of Online TPE Program Learning Percentage Did in-depth studies discuss material in accordance with subject expertise and future demands?	99.7%	0.3%

2	Did in-depth studies discuss problem-based material and train higher-order thinking?	99.7%	0.3%
3	Were learning tool development activities oriented to the current curriculum and 21st-century skills?	99.7%	0.3%
4	Were activities related to learning tools development problem-based and designed to train higher-order thinking?	99.7%	0.3%
5	Were activities related to learning tool development carried out by instructors (lecturers and teachers) who are experts in their fields?	99.7%	0.3%
6	Did instructors (lecturers and mentor teachers) provide feedback/input on the developed learning tools?	99.7%	0.3%
7	Did you receive any briefing before taking the Comprehensive Test?	100%	0%
8	Did the Comprehensive Test assess aspects of religious moderation and Al-Quran reading and writing (BTQ) in addition to testing aspects of pedagogical and professional competence?	99.7%	0.3%
9	Did you find assistance from lecturers and mentor teachers compelling?	99.7%	0.3%
10	Did the institution organize activities that improve technology Pedagogy Content Knowledge (TPACK)?	98.8	1.2%
11	Did the institution organize activities that improve research writing skills?	97.6	2.4%
12	Did you carry out research activities (Classroom Action Research)?	98.5%	1.5%

The results presented in Table 1 indicate that the implementation of online learning in the Teacher Professional Education (TPE) program at the university has yielded satisfactory outcomes. Analyzing the responses from 327 participants, a significant majority expressed that the learning materials align well with the expertise and requirements of future teachers. Additionally, the development of learning tools based on Higher Order Thinking Skills (HOTS) and problem-solving strategies was reported to be effective, with instructors providing constructive feedback throughout the process. The comprehensive exam assesses various aspects, including pedagogical competence, professionalism, insights into religious moderation, Quran reading and writing (BTQ), and Practical Teaching Experience (PTE), all of which were conducted successfully. However, challenges persist, such as limited internet accessibility and connectivity issues, particularly in remote and rural areas. Furthermore, there are concerns regarding the motivation of teachers nearing retirement, many of whom are female, which still need to be addressed.

Online learning enhances accessibility, flexibility, and engagement opportunities through the use of a Learning Management System (LMS). The LMS in question is equipped with a video conferencing feature called Jitsi Meet; however, both lecturers and students preferred to use alternative platforms like Zoom and Google Meet. This preference is attributed to several factors, including the smoother performance, user-friendliness, and familiar features of these platforms. Additionally, for quick communication and announcements, WhatsApp (W.A.) was often utilized due to its extensive capabilities for efficiently reaching all participants. For supplementary materials and learning videos, YouTube was the go-to choice for lecturers and students, given its reliability in streaming and ease of access. The choice of these platforms

illustrates how lecturers and students have flexibly adapted to ensure a smooth and effective learning process tailored to their needs and preferences.

The implementation of online learning in the Teacher Professional Education (TPE) Program at the university has proven effective across several key aspects. This research corroborates previous findings that online education offers increased flexibility and accessibility for learners (Anderson & Dron, 2011). The study's in-depth activities, which align with teachers' expertise and future needs, demonstrate that the materials provided are both relevant and supportive of teacher competency development (Kim et al., 2019). Furthermore, the development of learning tools focused on Higher Order Thinking Skills (HOTS) and problem-solving, along with the integration of a 21st-century curriculum, indicates that the program meets the demands of modern education, which emphasizes critical thinking and problem-solving capabilities (Sepriyanti et al., 2022; Mat et al., 2023). Additionally, constructive feedback from instructors reinforces constructivist learning theory by highlighting the significance of interaction and reflection in the learning process (Vygotsky, 1978).

Despite the benefits of online learning, several challenges hinder its effective implementation, particularly in Indonesia. Limited internet access and connectivity issues in remote areas, along with the persistent digital divide, pose significant barriers to successful online education (Rohayani et al., 2015). Additionally, the motivation levels of teachers nearing retirement, especially female educators with high self-efficacy, highlight the necessity for more personalized approaches and tailored support for this demographic (Ertmer et al., 2012; Mustadi et al., 2023). Overall, while the TPE program at the university offers numerous advantages through online learning, it is crucial to address these challenges to enhance the program's effectiveness and sustainability. Strategies such as improving digital infrastructure in underserved areas and providing ongoing professional development for teachers could serve as vital initial steps (Tondeur et al., 2016).

### **Theme two: Curriculum Adaptation and Innovation**

Interviews with university managers revealed that a benchmarking strategy has been effectively implemented to enhance and innovate the curriculum for online Teacher Professional Education (TPE) programs. The dean emphasized that the university has successfully launched several exemplary programs, drawing insights from comparative studies and documentation from leading institutions such as UIN Sunan Kalijaga Yogyakarta and Yogyakarta State University (S, personal communication, December 2023). Furthermore, the Head of the TPE Study Program highlighted the successful implementation of a student pre-conditioning system at every stage of TPE learning. This system utilizes the Learning Management System (LMS) called SPACE, incorporates Jitsi Meet for video conferencing, and includes a Computer-Based Test (CBT) that resembles the knowledge exam application for practice (F, personal communication, December 2023). These advancements showcase the university's innovative and adaptive approach to enhancing cybergogy learning practices.

The Decree of the Ministry of Religious Affairs (MoRA) of the Republic of Indonesia No. 754 of 2020 outlines the guidelines for organizing In-Service Teacher Professional Education (TPE), specifying a curriculum structure of 36 credits. This includes 24 credits for Recognition of Past Experience, 5 credits for in-depth studies in Pedagogical and Professional development, 3 credits for Learning Tool Development, and 4 credits for Field Experience Practice. Following these guidelines and the results from benchmarking, the curriculum has been analyzed and disseminated throughout the academic community for adaptation and implementation. Consequently, several innovations and adaptations have been introduced in the TPE curriculum, such as training programs for video development, training for writing Teacher Action Research, the creation of Computer-Based Tests (CBT) to prepare students

for practical exams, and support for students in completing their UKIN portfolios. These innovations are often delivered through a hybrid model, incorporating blended learning approaches.

These innovations reflect the university's commitment to staying relevant and responsive to the online organization of Teacher Professional Education (TPE). Adapting the curriculum to focus on developing Higher Order Thinking Skills (HOTS) and 21st-century competencies is crucial for preparing prospective teachers to meet the challenges of modern education. Research indicates that integrating technology into learning enhances student motivation and engagement (Katyara et al., 2023; Haryani et al., 2021). Additionally, studies have shown that training centered on HOTS development effectively improves learners' analytical and problem-solving abilities (Sepriyanti et al., 2022; Setiawan et al., 2021). Overall, the TPE program at the university demonstrates adaptability to the latest educational advancements through benchmarking strategies and curriculum innovations, resulting in programs that are responsive to the demands of digital-era education.

### **Theme three: Performance of lecturers and mentor teachers**

The interviews conducted with lecturers and mentor teachers shed light on the preparation required for delivering effective online learning aimed at enhancing teacher professionalism within the TPE program. Lecturer One and Mentor Teacher One emphasized the significance of participating in training sessions, mastering online platforms, and collaborating with colleagues to devise effective teaching strategies (Lecturer One, personal communication, February 2024; Mentor Teacher One, personal communication, February 2024). Lecturer Two highlighted the importance of skill development, innovative pedagogy, supportive technology, practical assignments, and consistent feedback to bolster teachers' professionalism, while Mentor Teacher One underscored the necessity of monitoring progress, gathering feedback, and creating a nurturing learning environment (Lecturer Two, personal communication, February 2024; Mentor Teacher One, personal communication, February 2024). Additionally, Alumnus One commended the guidance offered by lecturers and mentor teachers, noting their successful adaptation to new educational technologies. Alumnus Two pointed out the importance of learning discipline, peer collaboration, and regular feedback in sustaining motivation and updating teaching practices (Alumnus One, personal communication, February 2024; Alumnus Two, personal communication, February 2024). These insights highlight strategies that resonate with heutagogy, peeragogy, and cybergogy, reflecting a strong commitment to continuous professional development and self-directed learning in online education. By engaging in training sessions and familiarizing themselves with online platforms, instructors exhibit self-directed learning, taking proactive steps toward their professional growth (V. C. X. Wang & Torrisi-Steele, 2015).

Collaboration among lecturers and mentor teachers plays a pivotal role in preparation strategies, reflecting the principles of peeragogy (Keengwe & Kidd, 2010; Corneli et al., 2015; Sembiring et al., 2024). Peeragogy emphasizes the significance of learning from one another's experiences and knowledge, fostering a collaborative learning environment. By exchanging best practices and creating interactive content, instructors cultivate a supportive community of practice. This collective approach is essential for ongoing professional development, enabling educators to share ideas, tackle challenges together, and refine teaching methods through shared insights. In the context of the TPE program, this collaborative spirit also aligns well with heutagogical approaches that emphasize self-directed and peer-supported learning, crucial in the digital era.

The focus on utilizing the SPACE platform in the TPE program and integrating supportive technology into teaching reflects the principles of cybergogy, which emphasizes the use of digital tools to enhance learning experiences. By developing interactive content and

employing innovative pedagogical methods, instructors adopt a proactive approach to fostering engaging and effective online learning environments. Cybergogy merges technology with pedagogy to create immersive and impactful educational experiences (Wang & Kang, 2006). Instructors' dedication to mastering the SPACE platform and creating technology-enhanced teaching strategies underscores their commitment to leveraging digital tools to boost student engagement and improve learning outcomes (Koehler et al., 2013).

Instructors emphasize the importance of practical, problem-based assignments and regular feedback as essential strategies for enhancing teacher professionalism. Problem-based learning (PBL) encourages students to tackle real-world problems, promoting critical thinking and the practical application of knowledge. Furthermore, regular feedback mechanisms facilitate continuous assessment and improvement of teaching practices. These strategies are vital for cultivating the relevant skills and competencies necessary for teachers, aligning closely with the program's vision and learning outcomes.

Instructors focus on cultivating a supportive and motivating learning environment to facilitate effective online education by closely monitoring student progress, gathering feedback, and tracking participation and engagement. This strategy promotes student involvement and motivation, which are essential for successful online learning and professional development. Interview data indicate that instructors utilize methods rooted in heutagogy, peeragogy, and cybergogy, incorporating practical problem-based learning and feedback mechanisms. Together, these strategies create a strong framework for online education that enhances teacher professionalism and elevates overall educational quality. Theoretical backing from academic literature further reinforces the relevance and effectiveness of these approaches in the realm of online learning.

#### **Theme Four: The Impact of Online Learning in Teacher Professional Education on Professional Development**

To determine the impact of online TPE learning, alumni were given a questionnaire consisting of specific questions. These questions aim to measure the extent of the effects of online TPE learning in improving teacher competence during online TPE. Overall, TPE alumni responded positively to the perceived impact of online TPE learning, as shown in Table 4.

Table 2. Questionnaire Results of Participants' Perception on the Impact of Online TPE Learning (N: 327)

No	Statement No.	Percentage	
		Yes	No (0)
	Perceived Impact of Online TPE Learning		(1)
1	Did the material deepening program activities improve your competence?	99.4%	0.6%
2	Do learning tool development activities improve your competence?	99.7%	0.3%
3	Does teaching practice experience improve your competence?	99.7%	0.3%

The questionnaire results in Table 2 indicate that the deepening program activities, development of learning tools, and teaching experience practice are very effective, with a percentage of positive responses reaching almost 100%. The assessment of alumni by graduate users on a scale of 1-4 (1 = Poor, 2 = Fair, 3 = Good, and 4 = Very Good) also shows a high level of professionalism, especially in the aspects of ethics, mastery of core competencies,

communication skills, teamwork, and self-development, with an average assessment of 3.4 as shown in Table 3.

Table 3. Questionnaire Result of Graduate Professionalism (N: 169)

No	Y: Graduate Professionalism	Percentage %				Average
		Poor (1)	Fair (2)	Good (3)	Very Good (4)	
I	Ethics					
1	Individual ethics	1.2%	0%	30.2%	68.6%	3.7
2	Social Ethics	0.6%	0%	29%	69.8%	3.7
3	Professional ethics	0.6%	0.6%	36.1%	63.3%	3.6
II	Main Competencies					
A	Expertise in accordance with scientific fields (main competencies)					
4	Knowledge in the field or discipline	0%	0%	48.5%	50.3%	3.5
B	Foreign Language Proficiency					
5	Arabic language skills	5.9%	20.7%	60.4%	13%	2.8
6	English language skills	6.5%	27.8%	57.4%	8.3%	2.7
C	Use of Information Technology					
7	Internet skills	1.2%	4.7%	43.8%	50.3%	3.4
8	Computer skills	1.2%	7.1%	39.6%	52.1%	3.3
D	Ability to Communicate					
9	Ability to communicate with students	0.6%	0%	34.9%	64.5%	3.6
10	Ability to communicate with peers	0.6%	0%	33.1%	66.3%	3.7
11	Work in a team / cooperate with others	0.6%	0%	34.3%	65.1%	3.7
E	Teamwork					
12	Working in a team	0.6%	0%	33.1%	66.3%	3.6
13	Tolerance	0.6%	0.6%	29.6%	69.2%	3.6
14	Adaptability	0.6%	0.6%	37.9%	60.9%	3.6

No	Y: Graduate Professionalism	Percentage %				Average
		Poor (1)	Fair (2)	Good (3)	Very Good (4)	
15	Loyalty	0.6%	0.6%	37.3 %	61.5%	3.4
16	Integrity	0.6%	1.2%	40.2 %	58%	3.4
17	Working with people from different cultures and backgrounds	1.2%	1.8%	53.8 %	43,2%	3.6
18	Leadership	0.6%	3.6%	53.8 %	42%	3.4
19	Ability to hold responsibility	0.6%	1.8%	37.3 %	60,4%	3.5
20	Project/program management	0.6%	1.8%	55.6 %	42%	3.5
F	Personal Development	0.6%				
21	Al-Qur'an Reading and Writing	0.6%	2.4%	39.1 %	58%	3.3
22	Knowledge in accordance with field or discipline	0.6%	0%	49.1 %	50.3%	3.4
23	Knowledge outside the field or discipline	0.6%	1.2%	64.5 %	33.7%	3.4
24	Critical thinking	1.2%	1.8%	55%	41.4%	3.2
25	Creative thinking	0.6%	0.6%	56.2 %	42.6%	3.5
26	Research skills	1.2%	9.5%	60.9 %	28.4%	3.4
27	Study skills	1.2%	0.6%	49.7 %	48.5%	3.4
28	Time management	0.6%	2.4%	51.5 %	45.6%	3.4
29	Working independently	0.6%	3%	47.3 %	49.1%	3.3
30	Ability to solve problems	0.6%	3%	52.1 %	44.4%	3.4
31	Analytical ability	0.6%	2.4%	61.5 %	35.5%	3.6
32	Initiative	1.2%	1.8%	54.4 %	42.6%	3.4
33	Empathy	0.6%	1.2%	40.8 %	57.4%	3.6
34	Ability to present ideas/products/reports	0.6%	1.2%	60.4 %	37.9%	3.4
35	Ability to write reports, memos, and documents	0.6%	3,6%	59.8 %	36.1%	3.3
36	Ability to continue lifelong learning	.,6%	1.8%	46.7 %	50.9%	3.5

No	Y: Graduate Professionalism	Percentage %				Average
		Poor (1)	Fair (2)	Good (3)	Very Good (4)	
Average						3.4

Table 3 shows a very positive percentage of knowledge of the subject matter, the use of information technology, communication skills, teamwork, and self-development in line with the profile of TPE graduates as stated (Decree of MoRA Number 745 of 2020 concerning Guidelines for the Implementation of In-Service TPE at MoRA). However, there is room for improvement in alumni foreign language skills, especially in English and Arabic. Furthermore, the effect of online TPE learning (X) on Professionalism (Y) is calculated with the help of JAMOVI.

Hypothesis testing:

Ho: Online learning (X) has no significant effect on Alumni Professionalism (Y)

Ha: Online learning (X) has a significant effect on Alumni Professionalism (Y)

Significance Testing Criteria:

If the p value >  $\alpha$ , then Ho is accepted.

If the p value <  $\alpha$ , then Ho is rejected.

Table 4. Testing the Relationship between Variables based on Model Fit Measures  
Model Fit Measures

Model	R	R <sup>2</sup>	Overall Model Test			
			F	df1	df2	p
1	0.573	0.329	81.8	1	167	< .001

The Model Fit Measures in Table 4 shows the value of R = 0.573, which means a moderate relationship Chin (1998) exists between Online Learning and Learning Outcomes. To determine the contribution amount of variable X to Y, use the formula R Square x 100% = 0.329 x 100% = 32.9%. The contribution of online learning variables to professionalism is 32.9%, while the remaining 67.1% is contributed by other variables not examined or outside the scope of the study. The p value in the Overall Model Test column is used to test the significance of the regression line equation. The p-value = 0.001; if the p-value <  $\alpha$ , then H0 is rejected, and Ha is accepted. This means that online learning significantly affects professionalism in TPE learning at state IHE institution.

This research highlights the significant positive effects of online learning on teacher professionalism. One of the key benefits is the enhancement of pedagogical skills through the use of technology, such as videos and simulations, which provide effective avenues for developing teaching competencies. This finding aligns with the studies by Boling et al. (2012) and Sembiring et al. (2024), which demonstrate that incorporating technology into educational practices can enrich teaching methods, making the learning process more interactive and engaging. Furthermore, the use of technological tools not only improves general pedagogical

skills but also supports the development of psychomotor competencies essential for teacher certification (Musthofa et al., 2023). Moreover, teachers who previously integrated technology into their teaching practices indicate that their psychomotor skills may stem from their accumulated teaching experiences rather than solely from the Teacher Professional Education (TPE) program (Mansurjonovich, 2023). This suggests that the integration of technology within online learning environments and certification programs plays a crucial role in enhancing teachers' professionalism and teaching effectiveness (Etkina et al., 2017; Musthofa et al., 2023; Laili et al., 2022). By fostering technological fluency, online learning equips teachers with the necessary tools to thrive in contemporary educational settings.

Online learning significantly expands the integration of technology in teaching, aligning with research conducted by Koehler et al. (2013), Quddus (2019), and Ritonga et al. (2024). This broader application of technology allows educators to explore various digital tools and resources, enriching students' learning experiences and enhancing educational effectiveness. From a theoretical perspective, this integration can be analyzed through the TPACK (Technological Pedagogical Content Knowledge) framework, which underscores the necessity of combining technology with pedagogical and content knowledge. TPACK enables teachers to recognize how technology can effectively support and extend learning opportunities (Koehler et al., 2013).

Moreover, online learning fosters collaboration among teachers, facilitating the exchange of best practices (Keengwe & Kidd, 2010; Ertmer et al., 2012; Teo et al., 2021). This collaborative environment promotes professional development by providing a platform for discussions, idea sharing, and the development of innovative teaching strategies. Additionally, online learning increases the accessibility of education, offering flexible and inclusive learning opportunities (Wang & Torrisi-Steele, 2015; Fauyan, 2019; Herliandry et al., 2020; Mariyudi et al., 2021). With the flexibility of online learning, both teachers and students can access educational materials anytime and anywhere, which is particularly beneficial for those facing time or location constraints. Overall, online learning not only enhances technological integration and collaboration but also promotes greater accessibility, thereby transforming the educational landscape.

The research findings resonate with contemporary 21st-century pedagogical theories, specifically heutagogy, peeragogy, and cybergogy, which are particularly pertinent to online learning in teacher professional development programs. The practical implementation of these theories can inspire and motivate educators to refine their teaching approaches. Heutagogy emphasizes self-directed learning, using technology as a tool for exploration and discovery. In contrast, peeragogy centers on collaboration facilitated by online platforms, fostering a supportive learning community. Meanwhile, cybergogy integrates traditional and digital pedagogical methods to accommodate diverse learning styles and cultivate engaging, interactive environments (Wang & Kang, 2006; Blaschke, 2012; Corneli et al., 2015).

While online learning offers numerous benefits, it also presents several challenges that can impact the educational experience. One significant issue is the lack of face-to-face interaction, which can impede the development of relationships between lecturers and students, as well as hinder effective assessment of student progress (Rahmawati & Narsa, 2019). Additionally, limited opportunities for practical classroom teaching may restrict the enhancement of essential teaching skills. Maintaining student engagement is another critical challenge, as disengaged students may find online learning less effective (Boling et al., 2012). These issues are often compounded by the quality of internet connectivity; unstable connections can disrupt access to learning materials, hinder discussions, and complicate assignment submissions, particularly during online assessments (Uji Pengetahuan). Research by Bao (2020) indicates that poor connectivity leads to frustration and decreased motivation

among students, resulting in missed information and diminished understanding. Furthermore, the theory of connectivism (Siemens, 2005) highlights the importance of networks and connections in digital learning, underscoring the need for effective online collaboration among educators to address these challenges.

The considerations outlined above are crucial (Dittmar & McCracken, 2012). Previous research indicates that TPE teachers benefit from individualized mentoring, active engagement, and ongoing professional development that incorporates technology to enhance communication and interaction, alongside consistent assessment methods that utilize self-evaluation and continuous learning themes. Despite some challenges, the online TPE program at the university has demonstrated significant success in fostering teachers' professionalism, with the majority of respondents providing positive evaluations of various competencies. These findings support the notion that online learning can be an effective approach for teacher professional development (TPD) in Indonesia, provided that TPE is implemented effectively. Furthermore, Indonesian Higher Education (IHE) institutions are expected to improve their services, particularly in the TPE program, while continuing their efforts to integrate scientific knowledge with religious education (Khozin & Umiarso, 2019).

## CONCLUSION

This study examines the influence of online learning on teacher professionalism within the in-service Teacher Professional Education (TPE) program at a State Islamic Higher Education (IHE) institution in Indonesia, emphasizing online learning practices, curriculum adaptation, instructor preparation, and professionalism development. Rooted in the theories of heutagogy, peeragogy, and cybergogy, the research highlights the significance of self-directed, collaborative, and technology-enhanced learning, particularly in addressing the challenges faced by Generation X teachers. Quantitative analysis reveals a moderate positive correlation ( $R = 0.573$ ) between online learning and teacher professionalism, with 32.9% of the variance in professionalism explained by online learning ( $R^2 = 0.329$ ). This relationship is statistically significant, as confirmed by an F-test with a p-value of less than 0.001, leading to the rejection of the null hypothesis. Qualitative feedback from participants corroborates these findings, indicating satisfaction with the relevance of course materials, the development of learning tools, and the quality of instructor feedback. Additionally, curriculum adaptation through benchmarking has been identified as crucial for the program's responsiveness to the digital era's demands. The comprehensive preparation of lecturers, mentor teachers, and students is also essential for program success. Reports from alumni and graduate users indicate improved competencies, further reinforcing the quantitative evidence of online learning's substantial contribution to professionalism. Despite challenges such as limited face-to-face interaction and internet access, the study demonstrates that online learning has effectively enhanced teacher professionalism by providing greater accessibility, flexibility, and engagement opportunities.

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