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Teacher's Readiness Toward Artificial Intelligence in The School of North Bali

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Abstract: This study aims to analyze teachers' readiness to integrate artificial intelligence into education for the digital revolution. In this study, teachers were randomly selected with a total of 73 teachers from various subjects. This research used a quantitative method of using questionnaires for data collection. The data analysis technique in this research uses descriptive quantitative. Based on the research findings, technical ability, institutional support, adequate technological infrastructure, and school facilities affected teachers' readiness to use various types of artificial intelligence. Urban teachers were more ready than rural teachers, largely because urban teachers have more access to training materials and technology than rural teachers. In the future, in enabling AI to be used effectively to improve learning standards, government support needs to conduct specialized AI training at various school levels from urban to rural areas, in particular, stronger institutional support, and better school infrastructure and facilities to enhance teachers' readiness to face the digital revolution in education.

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Introduction

To increase creativity and productivity, artificial intelligence (AI) is beginning to be applied in several fields, including education (Ng et al., 2021). AI is marketed as a tool that can replace or complement certain teaching tasks, including performance evaluation, student progress tracking, and individualized support (Albacete et al., 2019; Chounta et al., 2022; Tarus et al., 2018). AI can help educators make informed choices about their teaching methods (Van Leeuwen & Rummel, 2020). Despite its potential, AI has not been consistently integrated into K–12 classrooms (Ferguson et al., 2016). Challenges include unmet expectations (Schiff, 2021), ethical dilemmas (Holmes et al., 2022), and technology-centric methodologies that neglect the role of teachers in AI adoption (Luckin et al., 2022). Teachers, as key players in AI implementation, often face readiness challenges that hinder effective AI adoption in education (Chounta et al., 2022). This readiness gap is related to the rapid advancement of AI technology that outpaces its integration in the classroom (Luan et al., 2020; Luckin et al., 2022).

The intellectual foundation of AI can be traced back to 1950, when Alan Turing outlined five techniques for machine intelligence, including cognitive learning and programming. During a workshop at Dartmouth College in 1956, the phrase "artificial intelligence" was formally coined (Sciberras & Dingli, 2023; Pratschke, 2024). AI seeks to create systems that can learn, reason, and solve problems to mimic human cognitive

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processes (Rainer et al., 2016). The development of AI has been accelerated by recent advances in algorithms and processing capacity (Chan & Colloton, 2024).

According to Chan and Colloton (2024), artificial intelligence (AI) can be divided into three categories: artificial narrow intelligence (ANI), artificial general intelligence (AGI), and artificial superintelligence (ASI). Although ANI can complete some tasks, it is not as intelligent as humans. Although not yet fully developed, AGI will be able to perform a variety of intellectual activities on its own. The most advanced type, ASI, has the potential to outperform humans in everything, including emotional reasoning and creativity.

A subtype of artificial intelligence called generative AI uses data input to generate new materials. Digital art, personalized education, and virtual assistants are among its uses (Feuerriegel et al., 2024). The potential of generative AI to revolutionize the artistic and professional realms is exemplified by well-known technologies such as GPT-4 and DALL-E 2. However, the caliber of the learning procedures and training data will determine how successful it will be.

AI in education can help educators design effective and engaging lessons (Clark, 2024). AI can reduce administrative responsibilities, increase creativity, and automate work (Haseski, 2019). However, teachers must be AI literate to integrate AI; this includes pedagogical creativity, ethical awareness, and continued professional growth (Chan & Colloton, 2024). According to previous research (Holmstrom, 2022; Karaca et al., 2021; Luckin et al., 2022), AI preparation includes teachers' skills, goals, and moral concerns for using AI in the classroom. Teachers who are well prepared for AI may use it to innovate and feel more satisfied with their work, but others who are not prepared may fear or resist it (Chounta et al., 2022; Luckin et al., 2022). There is currently little research on how generative AI impacts teacher preparation, especially in high schools. The majority of research focuses on digital or basic technology literacy (Zawacki-Richter et al., 2019; Koehler & Mishra, 2009). Furthermore, this research has largely focused on the use of AI in administration and improving student learning (Holmes et al., 2019; Luckin, 2018), paying little attention to how it impacts teacher readiness, particularly in areas such as Bali.

The Readiness Artificial Intelligence Applications Scale (RAIS) was used in this study to assess teacher readiness for AI. RAIS, created by Ramazanoglu & Akin (2024), assesses teacher readiness to incorporate AI by looking at factors such as technology efficacy, student engagement, and ethical awareness. Examining teacher readiness is critical to ensuring that AI adoption is successful and complements the learning process well, as instructors play a critical role in the success of AI implementation in education.

Examining how teacher readiness to incorporate artificial intelligence (AI) into their teaching methods is the aim of this review of articles. AI has grown in importance as a tool in education, providing chances for more individualized instruction, more efficient administration, and improved teaching strategies. However, teachers' readiness to adjust to this technological change will play a major role in its successful implementation. This review investigates teachers' present comprehension and knowledge of AI applications as well as their ability to integrate AI-powered resources into teaching methods. It also discusses the major issues that teachers deal with, such as a lack of enabling infrastructure, poor training opportunities, and restricted access to resources. In addition to impeding the adoption of AI, these obstacles draw attention to the differences in readiness among teachers, especially in areas with potentially more limited resources like North Bali. Designing solutions that guarantee the fair and long-term integration of AI in education requires an understanding of these issues.

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Insights regarding tactics and best practices that might improve teachers' readiness for AI adoption are another goal of this assessment. By examining effective case studies from comparable educational settings, it provides practical suggestions that North Bali's schools and legislators might put into practice to assist teachers. These include making sure there is enough technology infrastructure, providing thorough training programs to improve technical abilities, and encouraging a culture of ongoing professional growth. The evaluation emphasizes how crucial it is to establish a welcoming atmosphere that enables teachers to use AI as a tool for creativity rather than a barrier to overcome. In the end, it is anticipated that the results will help develop a localized knowledge of how AI may be successfully incorporated in North Bali, taking into account the unique requirements and conditions of local teachers. By emphasizing readiness, this analysis highlights how AI has the ability to revolutionize education and improve teaching methods and student results when used with the right guidance and planning.

Research Method

This research used a quantitative approach, in which data collection was done through questionnaires to teachers in North Bali. The questionnaire consists of 19 questions and 3 dimensions using RAIS (Readiness for Artificial Intelligence Application Scale) adapted from Ramazanoglu & Akin (2024) as in Table 1.

Table 1. RAIS (Ramazanoglu & Akin, 2024)

Dimensions	Questions
Technology Self-Efficacy	1. I can learn a programming language at a level that can create an artificial intelligence product 2. I can use artificial intelligence applications (such as ChatGPT, Chatboot, Bing, Dall-e, …) 3. I can analyze artificial intelligence data 4. I can solve the problems of artificial intelligence applications 5. I can develop artificial intelligence projects 6. I can manage artificial intelligence projects
Student Interaction	7. I can lead classroom discussions on artificial intelligence topics with student 8. I can encourage students to learn artificial intelligence topics 9. I can help students develop collaborative project on artificial intelligence 10. I can design activities that encourage student interaction regarding artificial intelligence 11. I can help students critically evaluate AI projects 12. I can mentor students for artificial intelligence projects 13. I can help student discover their talents in the field of artificial intelligence

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Ethical Awareness	14. I pay attention to data privacy in artificial intelligence applications 15. I exhibit ethical behaviour in the use of artificial intelligence applications 16. I can take precautions against unethical artificial intelligence practices 17. I can detect unethical AI practices 18. I can ensure personal data security in artificial intelligence 19. I am aware of my ethical responsibilities in artificial intelligence applications

Research was conducted in Buleleng district, with a sample size of 73 taken using simple random sampling technique. The samples were teachers from various subjects who represented teachers at the elementary to high school levels in various sub-districts. Details of the sample can be seen in Table 2 below.

Table 2. Research Sample and Population

Elementary School		Junior High School		Senior High School	
School	**n**	**School**	**n**	**School**	**n**
SD Negeri 1 Banjar Anyar	1	SMP Negeri 1 Seririt	1	SMA Negeri 1 Sukasada	3
SD Negeri 1 Pengambengan	1	SMP Negeri 1 Singaraja	3	SMA Negeri 1 Tejakula	2
SD Negeri 1 Temukus	1	SMP Negeri 2 Singaraja	1	SMA Negeri 3 Singaraja	1
SD Negeri 3 Sepang	1	SMP Negeri 2 Busungbiu	1	SMA Negeri 1 Sukasada	6
SD Negeri 4 Sembung	2	SMP Negeri 2 Tejakula	2	SMAS Lab Undiksha	23
		SMP Negeri 4 Busungbiu	1	SMK Negeri 1 Singaraja	8
		SMP Negeri 6 Singaraja	1	SMK Widya Dharma Bali	11
		SMP Negeri Satu Atap 2 Banjar	2	SMK Negeri 1 Kubutambahan	1

Quantitative descriptive approaches were then used to examine the data received from the questionnaire. The acquired percentage number was then evaluated in light of the eligibility requirements. The eligibility category is based on the following criteria (Arikunto, 2009).

Tabel 3. Feasibility Criteria

No	Score in percent (%)	Feasibility Category
1	< 21 %	Not Feasible
2	21 – 40 %	Less Feasible
3	41 – 60 %	Moderately Feasible
4	61 – 80 %	Feasible
5	81 – 100 %	Very Feasible

Results and Discussion

The study highlights that teachers' readiness to integrate AI into education is significantly influenced by technical ability, institutional support, technological infrastructure, and school facilities, with urban teachers showing better preparedness compared to their rural counterparts. This finding aligns with previous research indicating that infrastructure and institutional backing are crucial for effective technology adoption (Chounta et al., 2022; Luckin et al., 2022). The disparity between urban and rural schools mirrors broader global trends, where teachers in more developed regions have greater access to training and technological resources (Schiff, 2021; Ferguson et al., 2016). Moreover, the

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importance of specialized AI training and stronger institutional support for teachers is emphasized in studies that argue for systematic professional development to bridge the gap in AI readiness (Luan et al., 2020; Karaca et al., 2021). These findings suggest that in order to effectively integrate AI and enhance learning outcomes, targeted investments in training, infrastructure, and policy development are essential across all school levels, especially in rural areas (Ng et al., 2021; Holmes et al., 2022).

This research aims to examine the level of readiness of teachers in the North Bali region towards integrating Artificial Intelligence (AI) into their teaching practices. It employed a quantitative research design, using data collected through a structured questionnaire which adopted the Readiness for Artificial Intelligence Application Scale (RAIS). This scale measures factors like technology self-efficacy, AI engagement by students, and ethical awareness. The sample includes 73 teachers from elementary, junior high, and senior high schools in North Bali. Informed consent was obtained from all respondents before proceeding with the online survey using Google Forms; this survey was designed for data collection done in October 2024 from a randomly selected sample of teachers from administered diverse subject areas. This study aims to shed light on the barriers to AI adoption in education, including technological infrastructure, institutional support, and training availability, and is also One of the empirical, international researches that assess to what extent urban and rural teachers are ready to adopt AI in education.

This research primarily aims to investigate the degree of teacher preparedness in the implementation of AI in their learning activities, especially in North Bali. These assessments cover all aspects: teachers' technical competence, their ability to engage students with AI, and their ethical consideration of how AI functions. The investigation also aims to elucidate the determinants of this readiness, including the availability of technology, institutional support, and professional development opportunities In addition, the study looks to expose differences between urban and rural teachers so that education policymakers can consider them when designing effective AI training programs and support strategies. Last but not least, the conference also aims to help teachers across Bali to be prepared for contributing to the digital transformation in education so that all teachers receive equal access to AI tools in the education sector.

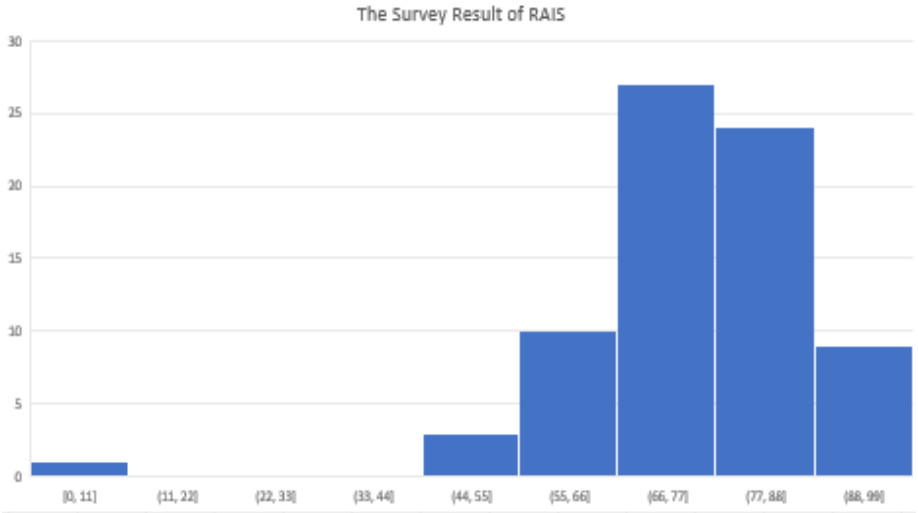

Figure 1. The Survey Results of RAIS

The results of the survey showed that most teachers in Balinese schools had a minimum knowledge of artificial intelligence concepts. Even though most teachers had some basic

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understanding of AI, more than 77,88% view it as a technological tool that might help with learning. This is obtained from the results of the feasibility test and by the eligibility criteria (Arikunto, 2009), albeit one they don't know much about in general a tiny minority (0,11%) could describe any specific applications or algorithms. Teachers in urban schools showed a significantly better awareness than teachers in rural schools due to their more frequent exposure to technology and infrastructural resources.

The disparity in AI literacy between my unique circumstances and those of someone from a Balinese school illustrates an opportunity gap that could impact the performance or adoption rate of AI across Bali's schools. This echoes what has been found in previous studies, which have generally reported that educators across the globe had no basic understanding of A (Ferguson et al., 2016). While teachers may well be aware of the benefits of their teaching, they do not have a full understanding of how AI works and an introduction to this might help make them more confident about using AI in their classroom (Luckin et al., 2022).

This can also restrict the ability of teachers to effectively integrate AI in classrooms. AI may be perceived as an external tool rather than an integrated part of teaching strategies if not understood properly. These findings point to a need for professional development programs that straddle this divide by simultaneously providing both conceptual and practical AI modules to encourage more proactive use of classroom-based AI technologies.

Survey results showed that 66,77% of respondents indicate limited access to necessary technology including computers, software, and reliable internet. These challenges were particularly clear in rural schools, where teachers cited old equipment and unreliable internet access as the main roadblocks. One of the prerequisites is to have reliable access to work technology which only 44,55% of teachers reported having. It highlights a larger academic issue, evident on a global scale and compounding in under-resourced areas of education. The effectiveness of educational reforms with new technology is also curtailed by such restrictions, as research indicates (Schiff, 2021). It must remove these constraints since no tools entail a teacher without AI capacity, thus limiting the class of all learning interventions driven by AI.

One key element that surfaced was the need for institutional support, as many teachers reported a lack of direction from their schools. These remain or below 40%, with only the same number of survey respondents feeling there was sufficient encouragement to adopt AI in their institutions. Without institutional support, teachers can be left with no systematic means of adopting AI technologies, and having such decision-making power centralized likely diminishes the autonomy to experiment with new teaching initiatives revolving around artificial intelligence.

Inclusive of a small sample size, with only 55,66% of teachers responding to AI training (indicative that few have had such experiences), professional development programs are confined to being one-off. Feedback from these teachers noted that programs were mostly centered around digital literacy, and lacked AI-specific curriculum. Those training sessions that included AI were also largely introductory, discussing the benefits of AI in education rather than providing concrete action steps to take in a classroom setting. This is consistent with earlier work identifying a lack of access to AI-focused professional development that can obstruct emerging technology in learning (Luckin, 2018). The results also mean that Balinese schools are in great need of a professional development course and experience in AI-enabled solution applications at school, which should relate to pedagogical stuff instead of system development DTOs.

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Training programs often focused on theory and missed practical AI applications important to classroom teachers. This means more directed, applied professional development. If teachers feel professional development is real-time and applies directly to their needs in the classroom, they are far more inclined to accept AI into their day. As such, engaging activities need to be more collaborative and fun less about the presentation of the latest tool available in the market.

The fact that teacher AI readiness also relies heavily on institutional support and policy frameworks. In schools with active administration promoting digital learning policies, teachers were more motivated to interact with new technologies like AI. Administrative support was notably higher in urban schools, particularly regarding strategic plans or policies that enabled AI use: 88,99% of teachers from urban areas reported their schools had such support.

Rural schools conversely provided lower policy support, and their teachers have had little contact with exploration through distant AI technology efforts. These administrative inconsistencies end up creating inequalities in AI readiness and potentially hamper the teacher's efforts to build those needed competencies. Research says that teachers need administrative support and the autonomy to not face policy backlash if they feel like experimenting with AI in their classroom, even just a little bit (Felix, 2020). In order to build a comprehensive readiness sustainability and AI-ready culture, common strategic policy underpinning of AI in every school should call for raising policy awareness to cover all schools.

Many teachers reported that the confidence-building effect of networking with other teaching peers (e.g. attending AI workshops and inter-school forums) led them to step farther out of their comfort zone into the practical experience/ skill development stage for deploying practices at school. Greater AI experimentation and interest, for instance, occurred in schools that helped teachers' team up. Nearly 45% of teachers identified learning informally from peers as a major avenue for getting an AI education, suggesting the critical role that professional collaborative environments play in this regard.

Closing this infrastructure gap, with the emphasis on rural areas especially will require increased investment in current hardware and stable internet service. By ensuring that all schools have the technological resources needed, AI readiness among teachers across Bali will be more balanced. That said, school administrations and policy-makers need to make access to technology a top priority so that every teacher no matter their location can also join this AI-driven learning.

Policies and guidelines in educational institutions should encourage full classroom integration of AI. School administrations can, for instance, develop AI-favoring policies that will help offer teachers a well-lit pathway to adopt AI. Further, integrating AI literacy into custom strategic planning and measuring within the performance metrics can make for transparent goals that allow a conducive environment to enhance innovation. It is essential to put in place dedicated AI-focused training programs that go beyond simply providing general digital literacy. Such programs should feature hands-on, classroom-ready experiences focused on practical applications that will equip educators with ways to use AI. Programs might include AI-assisted teaching, student assessment, and personalized learning experiences to enable teachers' knowledge of how artificial intelligence could advance current ways a teacher teaches.

Setting up networks or forums where teachers come together to learn from peers, access relevant resources and share experiences can help build the confidence in using AI.

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Establishing regular AI workshops in schools, for teachers to share experiences and work on challenges together will be a step that works. The characteristics of the data suggest that while collaborative informal learning is an important part of professional development, it works in conjunction with formal training and not as a replacement. This could point to structured peer networks being channeled toward complementing these efforts when used together.

Lastly, this could enable the introduction of yardsticks for measuring the implementation of AI in schools and would be good feedback to policy makers and school administrators. Assessment on an ongoing basis will identify the effectiveness of AI-related training, infrastructure improvements, and policy support in continued alignment with new teacher needs. Such ongoing check-ins can help ensure the sustainability and changeability of AI readiness efforts with advances in technology.

A comprehensive assessment of AI readiness at Bali trial to find gaps in pedagogy, infrastructure, institutional support, and self-development. The results highlight the necessity of a multi-dimensional strategy which should include infrastructure investment, policy intervention, and specific training schemes as well as mentoring to support AI readiness. Through an integrated approach to these aspects, schools in Bali can foster a learning ecosystem that will provide teachers with the meaningful support they need to make use of AI effectively and constructively, ultimately promoting quality education by allowing innovation.

The conceptual implications of the results from this study indicate that teachers' readiness to incorporate Artificial Intelligence (AI) in education is influenced by multiple factors, including technical ability, institutional support, and access to technological infrastructure. The findings highlight a significant disparity between urban and rural teachers, with urban educators exhibiting higher levels of readiness due to better access to technology, training, and support. This suggests that addressing the infrastructural and support gaps, particularly in rural areas, is crucial for ensuring equitable AI adoption across schools. Additionally, the study emphasizes the need for targeted AI training programs that go beyond digital literacy and provide practical, context-specific training to enhance teachers' confidence and competence in integrating AI tools effectively. For AI to truly transform education, a multi-faceted approach involving government support, better school infrastructure, and continuous professional development is necessary.

Conclusion

In brief, technical ability, institutional support, adequate technological infrastructure, and school facilities affected teachers' readiness to use various types of artificial intelligence. Urban teachers are more ready than rural teachers, largely because urban teachers have more access to training materials and technology than rural teachers. In the future, in enabling AI to be used effectively to improve learning standards, government support needs to conduct specialized AI training at various school levels from urban to rural areas, in particular, stronger institutional support, and better school infrastructure and facilities to enhance teachers' readiness to face the digital revolution in education.

Recommendation

The study highlights the demands of an integrated framework for increasing teachers' AI readiness in Bali. In addition, development initiatives should arguably focus on two priority areas: targeted and context-responsive training programs that offer more advanced

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data and digital citizenship training, as well as supportive institutional practices for the use of AI, coupled with investment in infrastructure. This framework facilitates AI skills and tools for educators to empower confidence in AI and facilitate its adoption as part of a holistic approach to developing true AI-empowered education through personalized learning and smart classroom management to improve educational outcomes.

A significant outcome of the study is an emphasis on investments in teacher training and technology infrastructure, as well as clear policy guidance, to help build a future-ready ecosystem for learning. Teaching toward the Socratic method will actually encourage a symposium of critical thinking-focused approaches to pedagogy as we work toward teaching educators the theories behind this new technology. Furthermore, continuous professional development, mentoring schemes, and collaborative learning environments must be set-up to ensure that teachers are supported and continuously improve over time with their AI readiness.

Finally, the paper highlights the importance of strong institutional support and clear policies for successful integration of AI. The absence of such frameworks puts schools at risk of violating existing laws and ethical frameworks around data privacy. By creating a community ecosystem where educators, AI developers, and policymakers can work together, we hope to foster solutions that are best suited for the specific culture of teachers and students in Bali. The paper closes with a call for more studies on the long-term impact of AI training on teaching practice and student outcome in various educational contexts.

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