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7 **Teachers' Attitudes Toward Integrating Artificial Intelligence Applications in Education: Practical**
8 **Understanding and Institutional Readiness Requirements**

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12 *Abstract*

13 **Background:** This study investigated the readiness of secondary school teachers
14 to integrate Artificial Intelligence (AI) applications into the educational process. It
15 specifically explored teachers' attitudes, current practices, and the systemic challenges
16 hindering effective implementation in the Galilee region.

17 **Methods:** A qualitative research design was employed, focusing on a population of 46 teachers
18 at Ibn Sina Comprehensive Secondary School. A purposive sample of 12 teachers
19 participated in semi-structured in-depth interviews. The study assessed technological
20 mastery, practical adoption levels, and barriers to AI integration through thematic
21 analysis.

22 **Results:** The findings revealed a high level of awareness regarding AI's importance, with
23 91.67% of participants recognizing it as a cornerstone for educational advancement.
24 Teachers exhibited highly positive attitudes, utilizing tools such as Gemini and
25 ChatGPT for lesson planning, administrative efficiency, and student assessment.
26 However, participants emphasized the necessity of human pedagogical oversight to
27 safeguard critical thinking. Major challenges identified included skill deficiencies,
28 inadequate infrastructure, limited institutional support, and a lack of specialized,
29 discipline-specific training.

30 **Conclusion:** The study concludes that transitioning from individual AI use to institutional
31 integration requires a robust framework. Key recommendations include securing
32 sustainable funding for infrastructure, launching comprehensive professional
33 development programs, and establishing ethical guidelines that balance technological
34 innovation with human-centered teaching.

35 **Keywords:** Teacher attitudes; Artificial Intelligence integration; Galilee region; Secondary
36 education; Institutional readiness; Pedagogical oversight.

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Introduction:-

1. Introduction

Artificial intelligence (AI) is a revolutionary application that promises radical transformations in the future of learning, playing a pivotal role in reshaping educational processes and instructional methods (**UNESCO, 2023a**). Consequently, local and international educational institutions have begun developing clear policies to regulate AI integration, considering ethical, cultural, and pedagogical dimensions (**UNESCO, 2023b; Chan, 2023**). While Arab nations like Saudi Arabia, the UAE, and Egypt have taken significant steps toward formulating these policies, the Palestinian context is also witnessing serious initiatives to establish national frameworks that suit the local educational environment (**Baka, 2025**). According to demographic and educational data from the **Central Bureau of Statistics (CBS, 2024)**, regional educational sectors, particularly in the North, are facing rapid technological shifts that necessitate a high level of institutional readiness.

Effective AI adoption requires assessing teachers' skills and professional development needs (**Al-Jarbawi, 2020**). AI applications enhance teacher performance by providing intelligent systems and analytics that foster creativity (**Karakose&Tulubas, 2024**). A deep understanding of AI is no longer a technical choice but a cognitive necessity (**Al-Shakasi& Al-Shakasi, 2025**). The importance of AI lies in adaptive learning and big data analysis, which identify student strengths and weaknesses (**Al-Shahoumi, 2024**). Furthermore, AI programs are instrumental in developing 21st-century skills and preparing students for future roles (**Mohamed & Mahmoud, 2020**). AI transforms traditional textbooks into intelligent systems (**Al-Waridat, 2024**) and provides innovative teaching methods through robotics and multimedia content (**Al-Harthi, 2023**).

Despite these benefits, challenges persist, including over-reliance on AI—which may negatively impact critical thinking—and technical infrastructure gaps (**Kattaneh, 2025**). Previous studies have explored these facets; for instance, **Al-Shakasi& Al-Shakasi (2025)** found that AI integration improves teacher self-efficacy, while **Al-Shahoumi (2024)** identified weak internet and high teaching loads as major barriers. In the Philippines, **Gamit (2023)** highlighted that teachers' lack of conviction regarding technology is a primary obstacle, and **Gocen&Aydemir (2020)** noted a general apprehension among educators regarding the future of the teaching profession. Consequently, **Al-Farani& Al-Musaad (2023)** and **Nasser (2023)** emphasized the urgent need for specialized training to enhance teachers' digital competencies and creative thinking skills.

This study addresses a critical gap by providing a deep qualitative analysis of the link between theoretical awareness and practical practices at **Ibn Sina Comprehensive Secondary School** in the Galilee. This research is particularly significant as it focuses on secondary education, a complex stage of cognitive and psychological development, requiring teachers to balance technological advancement with cultural identity. The study aims to explore teachers' perceptions, classroom practices, and the logistical support required for successful implementation. Ultimately, this research seeks to answer the following primary question: **What are the attitudes of teachers toward the integration of AI applications in education, in light of their perceptions, practices, and the challenges they face?**

2. Materials and Methods

This study employed a qualitative methodology based on semi-structured in-depth interviews. This approach was selected to provide a comprehensive analysis of teachers' attitudes and practices regarding AI integration, the challenges they encounter, and the levelof institutional readiness within their educational environment.

2.2. Participants and Context

The study was conducted at **Ibn Sina Comprehensive School (Secondary Level)** in the Galilee/Northern Region (Occupied Interior). This school serves as a critical case study due to its diverse academic and vocational pathways.

- **Study Population:** The total population consists of 46 male and female teachers at the school.

• **Study Sample:** A **random sample of 12 teachers** was selected for the in-depth interviews to ensure a representative range of perspectives across different subjects and grade levels.

2.3. Data Collection Instrument

The primary tool for data collection was a **semi-structured in-depth interview guide**, consisting of **11 questions** specifically designed to answer the research questions. The interview focused on four axes: theoretical perception of AI, practical classroom application, perceived obstacles, and required institutional support. For this study, AI is defined as advanced systems simulating human intelligence to enrich the educational process (Al-Shaqsi and Al-Shaqsi, 2025).

2.4. Validity and Reliability

To ensure the rigor of the qualitative findings, the following measures were taken:

• **Face Validity:**The interview protocol was presented to a panel of experts and specialists in curricula and instructional methods. Based on their feedback, the linguistic phrasing of several questions was refined to ensure clarity and alignment with the research objectives.

• **Reliability:**The interviews were recorded and transcribed verbatim. To ensure the consistency of the findings, a standardized coding model was applied. Both researchers independently coded and analyzed the participants' responses. The inter-rater reliability was calculated using Cohen's Kappa (K) coefficient, yielding a score of (0.82.) This value indicates a high degree of consistency and strong agreement between the coders, confirming the high reliability of the study's results and analysis.

2.5. Ethical Considerations

The study adhered to strict ethical protocols. Participation was voluntary, and all 12 interviewees provided informed consent. Data collection was carried out during the first semester of the academic year 2025/2026, and all personal identifiers were removed to maintain confidentiality

3. Results and Discussion

This section presents the findings of the qualitative analysis based on the participants' responses. The results are organized according to the research questions, integrating the statistical distribution of themes with pedagogical interpretation.

3.1. Teachers' Awareness of AI Integration (Addressing Research Question 1)

The first research question investigated the level of teachers' awareness regarding the importance of integrating AI applications. The analysis of the first three interview questions revealed a high and advanced level of awareness. Specifically, **11 out of 12 teachers (91.67%)** indicated that the core value of AI lies in personalized learning, a perception largely attributed to the specialized training courses provided to the staff. However, **8 teachers (66.67%)** expressed reservations, emphasizing the necessity of human pedagogical supervision to preserve students' critical thinking skills.

To further explore this awareness, the first interview question focused on defining AI and identifying known applications. The thematic analysis of the transcripts yielded five prominent themes, as summarized in **Table 1**.

Table 1. Teachers' definitions and attitudes toward AI (n=12)

Main Theme	Teacher Attitude	Frequency	% percent
Customization and Data-Driven Analysis	Positive	4	%33.33
Support Tool and Information Generator	Positive	4	%33.33
Enrichment and Enhancing Educational Engagement	Positive	4	%33.33

Focus on Assessment and Professional Development	procedure	3	%25.00
Caution in Adoption and Preference for Traditional Methods	challenge	1	%8.33

Discussion of Table 1 Results

The results in Table 1 reveal a high and shared positive trend toward the integration of Artificial Intelligence (AI) in education. The three positive themes identified showed an equal prevalence rate (33.33% each); one-third of the sample demonstrated a positive attitude toward using AI for personalizing education, another third viewed it as an instructional assistant, and the final third emphasized its role in making learning more engaging. This confirms that teachers perceive an integrated set of educational and operational benefits without a single dominant trend, reflecting a diversity of professional priorities.

However, a minimal minority (only one teacher) expressed reservations, preferring traditional methods. Qualitative evidence from the interviews (T.6, T.9, and T.10) highlighted that "AI is a supportive tool for humans to develop themselves in several fields and assist in educational practices."

The researchers attribute this consensus—that AI improves educational quality—to the interactive nature of these applications, which break instructional monotony and enhance student motivation. This finding is consistent with the studies of Al-Shakasi and Al-Shakasi (2025), Al-Shahoumi (2024), and Al-Harthi (2023), which all emphasized the role of AI in fostering attractive learning environments. Furthermore, the apprehension observed in a small percentage of teachers is likely due to pedagogical concerns regarding the "human dimension" in education or a perceived lack of specialized training in AI integration.

3.2. Sources of Knowledge and Professional Development (Addressing Interview Question 2)

To understand the foundations of teachers' expertise, the second interview question explored the sources and training courses they relied upon to acquire their understanding of AI. The analysis highlights a clear balance between **institutional support** and **personal initiatives**, as summarized in **Table 2**.

Table 2. Sources of AI knowledge among teachers (n=12).

Main Theme	Core Axis of Knowledge Acquisition	Frequency	percentage%
Formal and Institutional Training	School-based courses and workshops affiliated with the Ministry or specialized centers.	8	%66.67
Online Self-Learning	Open Educational Platforms (EdX, Coursera), YouTube tutorials, and technical articles	7	%%58.33
Scientific and Written Research	Reading research papers, scientific articles, and studies in educational journals.	6	%50.00
Practical Application and Project	Participation in practical projects (e.g., Basera App) or direct interaction with AI tools.	2	%16.67
Community Experience Exchange	Participation in professional learning communities and teacher groups (WhatsApp).	2	%16.67

Discussion of Table 2 Results

The analysis of knowledge sources in Table 2 indicates that teachers primarily rely on formal training, highlighting the pivotal role of schools and the Professional Development Centers within the Ministry of Education. This is followed by self-directed learning, which demonstrates high personal motivation and a professional commitment to keeping pace with rapid technological advancements. Practical implementation and the exchange of expertise ranked last; however, as T.3 noted: *"Practical experience allowed me to bridge the gap between theoretical learning and actual implementation."*

The researchers conclude that the acquisition of AI-related knowledge among teachers relies on a collaborative model that integrates structured institutional support with the continuity of individual self-learning. This balanced approach ensures that theoretical training is translated into classroom practice. These findings are consistent with the studies of Al-Shakasi and Al-Shakasi (2025), Al-Shahoumi (2024), and Al-Harthi (2023), which all underscore the necessity of multifaceted professional development to achieve digital competence.

3.3. The Impact of AI on Educational Outcomes (Addressing Interview Question 3)

The third interview question explored teachers' perceptions of how AI integration influences the quality and efficiency of educational outcomes. The thematic analysis of their responses revealed several key dimensions regarding pedagogical improvement, as illustrated in **Table 3.**

Table 3. Teachers' perceptions of AI's role in enhancing educational outcomes (n=12))

Main Theme	Teacher Attitude	Frequency	percentage%
Personalization and Adaptive Individualized Learning	Positive / Core Improvement	11	%91.67
Enhancing the Teacher's Role and Time-Saving	Positive / Job Support	8	%66.67
Systematic Assessment and Real-Time Analysis	Positive / Accurate Outputs	6	%50.00
Content Enrichment and Increasing Interaction	Positive / Quality of Experience	5	%41.67
Pedagogical Challenges and Ethical Controls	Challenge/ Requirement for Balance	2	%16.67

Discussion of Table 3 Results

The analysis in Table 3 reveals a significant consensus among teachers that AI represents a paradigm shift in educational quality, redefining the teacher's role as a facilitator and a creative leader. Participants (T.1 and T.2) noted: *"The teacher's role lies in personalizing education to suit the individual needs of each student, providing materials that allow every student to learn according to their level and abilities."* Furthermore, T.4 emphasized the importance of *"analyzing performance to identify strengths and weaknesses,"* while T.11 pointed toward a shift toward comprehensive assessment that tracks student growth rather than mere test scores.

The researchers attribute these highly positive responses to a growing conviction among educators that future educational systems must abandon the "one-size-fits-all" approach. AI is perceived as an ideal tool for adapting content and bridging knowledge gaps while alleviating the burden of routine tasks—such as grading—allowing teachers to focus on deeper instructional engagement. However, the findings also highlight a critical caveat: the necessity of human pedagogical monitoring to ensure that critical thinking and human interaction are not undermined.

This result is consistent with the studies of Al-Shakasi and Al-Shakasi (2025), Al-Shahoumi (2024), and Al-Harthi (2023), which all advocate for the integration of AI as a supportive—not replacement—element for the human educator to enhance student understanding levels.

3.4. AI Integration in Instructional Practices (Addressing Research Question 2)

The second research question explored the practical implementation of AI within the classroom. The analysis of teacher interviews reveals a significant transition from theoretical awareness to large-scale practical application. A substantial majority of teachers (83.33%) rely on generative AI tools, such as ChatGPT and Gemini, for dynamic content creation, while 66.67% focus on data-driven planning for activity design.

Furthermore, the results highlight a "hybrid professional model" adopted by 66.67% of the participants; this process begins with individual exploration and evaluation of AI tools, followed by peer-to-peer dissemination to ensure institutional success. To detail these practices, the fourth interview question asked teachers to specify the applications used in their daily instruction. The findings, showing a wide-scale practical variation, are summarized in **Table 4**.

Table 4. AI tools and applications integrated into daily teaching practices (n=12)

Main Theme	Core Application Axis	Frequency	percentage%
Content Generation and Assistance Tools	Chatbots for generating educational materials (ChatGPT, Gemini) and worksheet questions	10	%83.33
Adaptive Learning and Intelligent Assessment	Utilizing platforms that provide immediate feedback and adapt questions to students' levels.	8	%66.67
Visual and Interactive Enrichment	Using tools for image generation (Canva AI) and interactive simulations (PhET, Labster)	7	%58.33
Diagnostic Analysis and Non-curricular Assessment	Using tools to analyze student participation and data to identify strengths and weaknesses.	3	%25.00
Ethical Challenge and Cautious Handling	Challenge / Requirement for balance.	1	%8.33

Discussion of Table 4 Results

The findings in Table 4 show that a vast majority of the participants (83.33%) utilize generative AI tools, such as ChatGPT and Gemini, in their instructional routines. This high adoption rate indicates a significant reliance on these applications to optimize time management and automate repetitive tasks, such as designing worksheets and supportive educational models. Participants T.1 and T.10 elaborated on this, stating: *"I use Gemini to build educational materials and ChatGPT to generate real-life examples of chemistry applications."*

Conversely, the results identified a single dissenting view expressing pedagogical reservations. T.6 cautioned that AI could be a *"double-edged sword, as it can be used as a means to solve questions without effort,"* highlighting concerns about student cognitive engagement.

The researchers attribute this widespread usage to the strong correlation between the teachers' need for an "instructional assistant" and the accessibility of generative technologies. These tools serve as a vital resource that alleviates the burden of exhausting daily tasks, allowing teachers to redirect their energy toward classroom interaction. This result is consistent with the findings of **Al-Shahoumi** (2024), which emphasized the role of AI in improving teachers' operational efficiency.

3.5. Strategies for Lesson Planning and Implementation (Addressing Interview Question 5)

The fifth interview question delved into the procedural aspect of AI integration, specifically focusing on how teachers incorporate these tools during the pre-instructional (planning) and instructional (implementation) phases. The analysis reveals a structured approach toward digital lesson design and real-time classroom application, as detailed in **Table 5**.

Table 5. Mechanisms of AI integration in lesson planning and implementation (n=12)

Main Theme	Core Integration Axis	Frequency	percentage%
Data-Driven Planning	Analyzing students' levels and prerequisite needs to design appropriate activities and projects.	8	%66.67
Content Generation and Visual Enrichment	Using generation tools (ChatGPT/Gemini/Canva) to create ideas, questions, and interactive presentations	8	%66.67

Implementation via Simulation and Interactive Graphics	Integrating digital simulations (PhET) and graphing tools (Desmos) to simplify complex concepts during instruction.	6	%50.00
Immediate Assessment and Instructional Adjustment	Using automated assessment tools (Google Forms/Quizlet) for rapid evaluation and the possibility of instructional plan adjustment.	5	%41.67
Individual Support and Follow-up	Monitoring individual student progress and providing post-lesson support through data analysis.	3	%25.00

Discussion of Table 5 Results

The findings in Table 5 demonstrate a clear consensus regarding the integration of AI tools across various instructional stages. Two-thirds of the sample (66.67%) emphasized their reliance on AI for the planning phase. Specifically, participants (T.1, T.2, T.3, T.4, T.9, T.10, T.11, and T.12) confirmed that they utilize AI for lesson design, analyzing students' prior knowledge and academic needs, and tailoring activities to meet those individual requirements.

The researchers attribute this result to the teachers' advanced level of theoretical awareness, which has effectively translated into consistent classroom practices. By using AI to diagnose student needs before the lesson begins, teachers are able to move toward a more "proactive" rather than "reactive" instructional model. This result is consistent with the study of **Al-Shahoumi** (2024), which highlighted how AI integration facilitates the transition from general planning to personalized lesson design.

3.6. Collaborative vs. Individual AI Integration (Addressing Interview Question 6)

The sixth interview question examined the social and institutional dynamics of AI adoption, specifically whether teachers integrate these tools through individual efforts or via collaborative networks with peers and institutions. This dimension is crucial for understanding how technological innovations disseminate within the school environment. The analysis, showing a significant trend toward professional collaboration, is summarized in **Table 6**.

Table 6. Modalities of collaboration in AI integration (n=12)

Main Theme	Integration Axis	Frequency	percentage%
Hybrid Integration (Individual and Collective)	Starting individually to explore appropriate tools, followed by collaborating to develop shared plans.	8	%66.67
Individual Initiative as a Priority	Focusing on individual work for tool discovery and evaluation.	4	%33.33
Systematic Collaboration with Colleagues	Utilizing a collaborative framework to create shared tools, training new colleagues, and exchanging expertise.	5	%41.673
Institutional Integration and Collaboration with Students	Using applications to support institutional marketing and classroom projects that involve student engagement.	2	%16.67

Discussion of Table 6 Results

The findings in Table 6 reveal a sophisticated and flexible approach to AI integration, with the Hybrid Integration Model emerging as the dominant pattern (66.67%). This model is characterized by a two-stage process:

it begins with the teacher's individual initiative to search for, implement, and evaluate AI tools, and subsequently transitions into a collaborative phase where expertise is shared with peers. This is evidenced by T.2, who highlighted the *"exchange of resources and development of shared lesson plans,"* and T.3 and T.4, who emphasized that *"working together can develop stronger lessons and we can benefit one another."*

The researchers attribute the prevalence of this hybrid model to the inherent nature of modern AI applications, which require personal diligence and experimentation to bridge the "digital knowledge gap." By first mastering the tools individually, teachers gain the confidence to lead professional communities and ensure the quality of collective performance.

This result aligns with the **UNESCO (2023b)** framework, which encourages peer-to-peer knowledge sharing as a primary driver for institutional digital transformation. Furthermore, this collaborative spirit mirrors the findings of **Karakose&Tulubas (2024)**, who noted that school leadership in the AI era thrives when individual innovation is disseminated through collaborative networks.

3.7. Challenges to AI Integration (Addressing Research Question 3)

The third research question examined the primary obstacles hindering the effective integration of AI in the educational process. The analysis of teachers' responses to the seventh interview question revealed that 83.33% of participants identify weak infrastructure and unstable internet connectivity as the most critical logistical barriers, followed by the high financial costs of premium tools.

Beyond logistics, the findings highlighted a significant pedagogical challenge: the individual differences in teachers' digital skills. As teachers transition from basic "digital literacy" to "functional AI integration," a pressing need for hands-on, practical training has emerged. These technical and logistical constraints, which reflect the gap between teachers' theoretical readiness and the classroom reality, are summarized in **Table 7.**

Table 7. Technical and logistical challenges facing AI integration (n=12)

Main Theme	Core Challenge Axis	Frequency	percentage%
Infrastructure and Device Challenges	Shortage of modern devices and weak internet connectivity.	10	%83.33
Professional Training and Lack of Expertise Challenges	Lack of continuous professional training for teachers on modern tools and how to integrate them.	5	%41.67
	Costs of software licenses, devices, and classroom preparation	5	%41.67
Ethical Risks and Privacy	Concerns regarding data ethics, privacy, and ensuring student information security.	4	%33.33
Resistance to Change and Technical Compatibility	Student hesitation to adopt applications and the difficulty of system integration with traditional educational platforms.	3	%25.00

Discussion of Table 7 Results

The findings in Table 6 (Table 7 in your sequence) reveal a broad consensus among teachers that the primary barriers to AI integration are structural and resource-based rather than cognitive. A substantial majority (83.33%) identified infrastructure deficits—specifically device shortages and unstable internet connectivity—as the most critical hurdles. This was echoed by participants T.2, T.4, and T.10, who stated: *"The most prominent challenges include technical issues such as weak internet, lack of sufficient devices for all students, and the need for practical training to use these applications effectively."*

Additionally, 33.33% of the teachers raised concerns regarding the ethical dimensions of AI, signaling a sophisticated awareness of the need for robust policy frameworks. Participants T.1 and T.9 emphasized the *"necessity of adopting clear policies to ensure student environments are secure and that AI is not used in an irresponsible manner."*

The researchers conclude that teachers have successfully surpassed the initial barriers of awareness and willingness; however, the transition to sustainable implementation is hindered by external constraints. This indicates that the challenge is no longer cognitive but requires institutional intervention to provide the essential technical ecosystem. These results align with the study of **Gocen and Aydemir** (2020), which highlighted that infrastructure readiness is a prerequisite for the successful digitalization of schools.

3.8. Professional Skill Gaps and Training Needs (Addressing Interview Question 8)

Beyond logistical barriers, the eighth interview question focused on the internal challenges related to the **digital proficiency** of teachers and their colleagues. This question aimed to identify the "human factor" in AI integration—specifically, the variation in skill levels and the specific areas where teachers feel under-equipped. The analysis, which highlights the need for specialized rather than general training, is summarized in **Table 8**.

Table 8. Skill-related challenges and professional development needs (n=12)

Main Theme	Teachers' Orientation	Frequency	percentage%
Pedagogical and Critical Integration Challenge	The need for advanced skills to integrate applications effectively and teach students critical thinking regarding AI performance.	5	%41.67
Individual Differences in Skills and Training Needs	Lack of specialized training and the existence of gaps in expertise levels and adaptation to new tools.	5	%41.67
Resistance to Change and Fear of Innovation	Technical apprehension, preference for traditional methods, and difficulty in keeping pace with modern technological developments.	4	%33.33
Time Challenges and Effort for Keeping Pace	Limited time for continuous self-learning	3	%25.00
Ethical and Achievement Challenge	Difficulty in distinguishing between student work and AI-generated work, and ensuring data privacy.	2	%16.67

Discussion of Table 8 Results

The results in Table 8 reveal that the most significant internal challenge is the pedagogical and critical integration of AI, alongside a noticeable disparity in skill levels (41.67%). Participants (T.1, T.3, T.4, T.9, and T.10) articulated a crucial distinction, stating: *"The challenge is not a lack of skill in using the tool itself, but rather in how to develop new teaching methods that integrate these technologies effectively without undermining the core educational process."* Conversely, ethical and academic integrity concerns—such as the difficulty of distinguishing between student work and AI-generated content—recorded the lowest frequency (16.67%).

The researchers attribute the lower emphasis on ethical concerns to the teachers' focus on immediate instructional priorities. Educators are currently preoccupied with the practicalities of classroom integration and the lack of specialized training, which directly impact their daily performance. Furthermore, the concern over academic integrity is exacerbated by the absence of clear institutional policies and guidelines for managing AI-assisted assessments. This finding aligns with the study of Al-Shahoumi (2024), which emphasized that the primary hurdle for teachers is the transition from "technical operation" to "pedagogical innovation."

3.9. Institutional Readiness and Training Requirements (Addressing Research Question 4)

The fourth research question examined the institutional requirements necessary to foster a sustainable AI-integrated environment. The analysis of the final three interview questions reveals a clear consensus that institutional readiness requires a holistic transformation addressing technical, human, and ethical dimensions

simultaneously. To explore these needs, the ninth interview question focused on the specific types of training and support teachers require. The results, reflecting a high demand for specialized professional development, are summarized in **Table 9.**

Table 9. Required training and support for AI integration (n=12)

MainTheme	Core Training Axis	Frequency	percentage %
Training on Pedagogical and Critical Integration	Workshops focusing on integrating applications into the curriculum and developing critical thinking skills.	9	%75.00
Providing Infrastructure and Technical Support	Institutional support including providing internet connectivity, modern devices, and specialists to solve technical problems.	6	%50.00
Peer-to-Peer Workshops and Idea Banks	Establishing learning communities to exchange expertise and practices, and providing examples for activity banks.	6	%50.00
Training on Ethical Aspects	Raising awareness about AI ethics, data security, and its impact on equity.	2	%16.67

Discussion of Table 9 Results

The findings in Table 9 highlight that the primary demand among teachers is training on pedagogical integration, cited by 75.00% of the participants. This indicates a sophisticated awareness that the core challenge is not merely technical literacy, but rather the quality of utilizing AI to achieve higher-order educational goals. As noted by T.1 and T.3, the objective is *"designing classroom activities that make AI a creative partner"* rather than just a digital tool.

Conversely, training on ethical challenges received the least attention (16.67%). This suggests that teachers are currently prioritizing immediate procedural needs—such as planning, classroom implementation, and infrastructure—over broader social and ethical implications. Nonetheless, the need for future awareness was recognized by T.11, who advocated for *"training on AI ethics... regarding aspects such as fairness and privacy"* to ensure a secure learning environment.

The researchers attribute these results to a shift in teachers' thinking from identifying problems to proposing systemic solutions. They are advocating for an integrated support model that balances pedagogical quality with logistical reinforcement to resolve structural barriers. This confirms that effective professional development must be a hybrid of environmental readiness and competency building to ensure the sustainable and responsible integration of AI. These results align with the studies of Al-Farani and Al-Musaad (2023) and Gamit (2023), which emphasize that technical training is insufficient without a robust pedagogical and institutional framework.

3.10. Assessment of Institutional Support and Areas for Improvement (Addressing Interview Question 10)

The tenth interview question aimed to evaluate teachers' perceptions of the adequacy of current institutional support and to identify specific areas that require enhancement. This evaluative dimension is critical for understanding whether existing initiatives from schools and educational authorities align with the practical needs of teachers in the classroom. The analysis, which identifies a gap between provided training and logistical reality, is summarized in **Table 10**.

Table 10. Teachers' evaluation of institutional support and improvement areas (n=12)

Main Theme	Core Training Axis	Frequency	percentage%

Inadequacy or Limitation of Support	Absolute consensus that current support is inadequate for effective integration.	12	%100
Need for Improving Infrastructure	Demand for providing modern devices, high-speed internet, and a robust technical infrastructure.	10	%83.33
Need for Improving Systematic Training	Continuous, practical, and specialized training focusing on pedagogical and critical integration, rather than superficial technical aspects.	9	%75.00
Supporting Resources, Ethics, and Encouragement	Providing permanent technical support and establishing clear ethical policies.	6	%50.00

Discussion of Table 10 Results

The findings in Table 10 reveal an absolute consensus among participants that current institutional support is insufficient for sustainable AI integration. This deficiency provides a clear context for the logistical and skill-related hurdles identified in previous questions. Teachers are calling for a holistic support paradigm that transcends the mere provision of hardware, advocating instead for specialized workshops in AI-enhanced instructional design. Participants T.3, T.4, T.10, and T.12 emphasized this gap, stating: *"Frankly, support exists, but it is insufficient; there is still a lack of continuous training on new tools and a pressing need for clear pedagogical and ethical policies."*

Interestingly, the lower frequency of requests for ethics and privacy policies suggests that while teachers prioritize immediate functionality, they view a governing institutional framework as a foundational necessity rather than an optional skill. This indicates an understanding that successful integration requires a secure and regulated professional environment.

The researchers attribute these results to the fact that educational authorities are still adopting a "fragmented approach" to support, focusing on basic requirements without achieving a systemic transformation. This necessitates an urgent national strategy for funding and professional development to bridge the "executive gap" between theoretical policy and classroom reality. This conclusion is reinforced by the need for institutionalizing AI as a core component of the educational infrastructure rather than a peripheral tool.

3.11. Design Requirements for Effective Training Programs (Addressing Interview Question 11)

The eleventh and final interview question focused on a forward-looking perspective, asking teachers to propose specific criteria for designing training programs that effectively respond to their professional needs. These insights aim to bridge the gap between traditional professional development and the advanced demands of the AI era. The participants' recommendations, which emphasize applied, continuous, and context-specific training models, are summarized in **Table 11.**

Table 11. Teachers' recommendations for effective AI training program design (n=12)

Main Theme	Core Training Design Axis	Frequency	percentage%
Project-Based Practical Training and Implementation	Absolute consensus that programs must be interactive and project-based, rather than theoretical.	12	%%100
Specialization and Relevance	Categorizing teachers (beginner and advanced), directing training by specialization, and linking it to the curriculum.	7	%58.33
Continuous Support and Post-Training Follow-up	Follow-up through support groups, forums, and periodic meetings to ensure learning sustainability and the implementation of acquired skills.	6	%50.00
Focusing on Critical and Ethical Thinking	Integrating critical thinking, analysis, and ethical aspects to teach students to distinguish between personal creativity and ready-made solutions.	5	%41.67

Discussion of Table 11 Results

The findings in Table 11 demonstrate an absolute consensus (100%) among teachers that the effectiveness of AI training programs depends on a shift toward practical, interactive, and project-based learning rather than theoretical instruction. Participants (T.1, T.3, and T.6) emphasized that professional development must simulate real-world classroom environments to ensure seamless pedagogical integration. This unanimous agreement presents a decisive strategy for overcoming the skill-related barriers identified in previous sections.

Conversely, while still recognized, the focus on ethical dimensions and critical thinking was ranked lower by comparison. However, participants T.1 and T.9 highlighted a sophisticated requirement: the need for *"tools that help teachers measure the impact of AI on developing students' higher-order thinking skills,"* alongside structured ethical debates.

The researchers conclude that teachers have evolved from simply requesting "training" to demanding a high-quality, specialized, and discipline-specific professional development model. This shift indicates that educators now possess clear benchmarks for what constitutes effective AI enablement. These results are strongly supported by the studies of Al-Farani and Al-Musaad (2023), Al-Shahoumi (2024), and Al-Harthi (2023), all of which advocate for moving beyond "one-off" workshops toward sustained, applied, and context-aware professional learning communities

4. Summary of Key Findings

The thematic and quantitative analysis of the teachers' responses yielded the following primary results:

1. **Advanced Conceptual Awareness:** A significant majority of the participants (**91.67%**) demonstrated a high level of awareness regarding the transformative power of AI, identifying it as an indispensable tool for modern educational development.

2. **Predominantly Positive Disposition:** Teachers exhibited diverse and highly positive attitudes toward AI integration, primarily focused on **personalized learning**, informational support, and pedagogical enrichment. Only one participant expressed significant reservations, citing concerns over student dependency.

3. **Operational Implementation:** There is a strong emphasis on the practical utility of generative AI tools (e.g., **ChatGPT and Gemini**) to optimize lesson planning, automate routine administrative tasks, and enhance assessment accuracy.

4. **The Human-Centric Mandate:** Participants emphasized the necessity of **pedagogical human oversight**, asserting that AI should serve as a supportive partner rather than a replacement, to safeguard critical thinking and authentic human interaction in the classroom.

5. **Multi-dimensional Barriers:** The integration process faces critical hurdles, most notably **professional skill gaps**, inadequate digital infrastructure, and the challenge of fostering students' critical thinking amidst the availability of ready-made AI solutions.

6. **Institutional Readiness Deficit:** There is an **absolute consensus** regarding the insufficiency of current institutional support. Teachers advocate for a systemic overhaul that includes robust infrastructure, specialized subject-specific training, and continuous hands-on professional development.

5. Conclusions

This study underscores that the integration of Artificial Intelligence in the educational landscape of the Galilee region is no longer a technical luxury but a pedagogical necessity. While teachers exhibit a high degree of readiness and a proactive attitude toward utilizing tools like ChatGPT and Gemini, their efforts remain largely

individual and hampered by systemic gaps. The findings reveal that the transition from "sporadic use" to "sustainable innovation" depends heavily on institutional leadership.

In conclusion, fostering a successful AI-integrated environment requires a fundamental shift in educational management—moving away from traditional hardware provision toward building "Digital Learning Communities" and robust ethical frameworks. For AI to truly enhance human intelligence in the classroom, educational authorities must bridge the executive gap through targeted funding and specialized professional development. Ultimately, the synergy between human pedagogical oversight and technological

6. Recommendations

Based on the synthesized findings, the following recommendations are proposed to enhance the strategic integration of AI in educational settings:

• Strategic Infrastructure Investment: Educational authorities should prioritize sustainable funding to establish a high-performance digital ecosystem. This includes providing high-speed connectivity and a 1:1 student-to-device ratio to ensure equitable access to AI-driven learning tools.

• Targeted Professional Development (PD): Transitioning from general workshops to applied pedagogical training is essential. Training programs should focus on "AI-Pedagogy Integration," empowering teachers to use AI for developing students' critical thinking rather than merely delivering pre-packaged content.

• Institutionalizing Professional Learning Communities (PLCs): Schools should formalize collaborative networks among educators. By making PLCs a standard practice, institutions can foster a culture of peer-to-peer knowledge sharing and collective lesson design, supported by dedicated on-site technical support teams.

• Establishing a Comprehensive Ethical Framework: There is an urgent need for an institutional policy framework that defines clear, binding guidelines for AI ethics and academic integrity. This framework should provide teachers and students with explicit standards for responsible AI usage, data privacy, and authentic assessment practices**.**

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