

Effectiveness of 21st Century Learning Implementation Among Arabic Language Trainee Teachers in Malaysia

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Abstract

This study aims to evaluate the effectiveness of implementing 21st Century Learning (PAK21) among trainee teachers enrolled in the Bachelor of Education in Arabic Language program at a public higher education institution in Malaysia. The focus centres on three key dimensions: the extent of PAK21 element integration in teaching, the readiness of practicum school facilities, and the contributing factors in cultivating 21st-century skills among trainee teachers. Employing a quantitative approach, data were collected via questionnaires distributed to 103 final-semester trainee teachers who had completed Teaching Practicum I. The findings indicate that, despite a general awareness and basic application of PAK21 principles, implementation remains constrained by infrastructure limitations, lack of continuous training, and insufficient mastery of appropriate pedagogical strategies. Identified barriers include inadequate educational technology, non-conducive physical learning environments, and challenges in designing activities that promote higher-order thinking skills. The study recommends strengthening teacher training programmes through practice-based approaches, upgrading practicum school infrastructure, and integrating sustained professional development aimed at equipping educators with 21st-century competencies. These insights are intended to contribute to the improvement of teacher education programmes and to inform educational policies that promote learner-centred pedagogical transformation.

Keywords: 21st Century Learning, trainee teachers, Arabic language education, educational facilities, teaching practicum

ملخص

تهدف هذه الدراسة إلى تقييم مدى فاعلية تنفيذ مبادئ التعلم للقرن الحادي والعشرين (PAK21) بين معلمي اللغة العربية المتدربين الملتحقين ببرنامج البكالوريوس في تعليم اللغة العربية في إحدى مؤسسات التعليم العالي العامة في ماليزيا. تركز الدراسة على ثلاثة محاور رئيسية: مدى دمج عناصر PAK21 في التدريس، جاهزية مرافق مدارس التدريب العملي، والعوامل المساهمة في تنمية مهارات القرن الحادي والعشرين لدى المعلمين المتدربين. اعتمدت الدراسة المنهج الكمي، حيث تم جمع البيانات من خلال استبيانات وُضعت على ١٠٣ معلمين متدربين في الفصل الدراسي الأخير ممن أكملوا مقرر التدريب العملي الأول. تشير النتائج إلى أنه بالرغم من الوعي العام والتطبيق الأساسي لمبادئ PAK21، فإن التنفيذ لا يزال يواجه تحديات تتعلق بضعف البنية التحتية، نقص التدريب المستمر، وعدم كفاية إتقان الاستراتيجيات التربوية المناسبة. وتشمل المعوقات المحددة ضعف التكنولوجيا التعليمية، والبيئة المادية غير المهيأة للتعلم، والصعوبات في تصميم أنشطة تعزز مهارات التفكير العليا. توصي الدراسة بتعزيز برامج إعداد المعلمين من خلال أساليب قائمة على الممارسة، وتحديث البنية التحتية لمدارس التدريب، ودمج التطوير المهني المستمر الهادف إلى تزويد المعلمين بكفاءات القرن الحادي والعشرين. تهدف هذه النتائج إلى المساهمة في تحسين برامج إعداد المعلمين وإلى دعم السياسات التعليمية التي تعزز التحول نحو التعليم القائم على المتعلم.

الكلمات المفتاحية: التعلم للقرن الحادي والعشرين، المعلمون المتدربون، تعليم اللغة العربية، المرافق التعليمية، التدريب العملي

Abstrak

Penelitian ini bertujuan untuk mengevaluasi efektivitas implementasi Pembelajaran Abad ke-21 (PAK21) di kalangan calon guru yang mengikuti Program Sarjana Pendidikan Bahasa Arab pada sebuah institusi pendidikan tinggi negeri di Malaysia. Fokus penelitian ini mencakup tiga dimensi utama, yaitu tingkat integrasi elemen PAK21 dalam pembelajaran, kesiapan fasilitas sekolah praktikum, serta faktor-faktor yang berkontribusi dalam pengembangan keterampilan abad ke-21 pada guru pelatih. Penelitian ini menggunakan pendekatan kuantitatif dengan pengumpulan data melalui kuesioner yang disebar kepada 103 calon guru semester akhir yang telah menyelesaikan Praktikum Mengajar I. Hasil penelitian menunjukkan bahwa meskipun para calon guru secara umum telah memiliki kesadaran dan menerapkan prinsip-prinsip dasar PAK21, pelaksanaannya masih menghadapi berbagai kendala, seperti keterbatasan infrastruktur, kurangnya pelatihan berkelanjutan, serta belum optimalnya penguasaan strategi pedagogis yang sesuai. Beberapa hambatan yang teridentifikasi meliputi keterbatasan teknologi pendidikan,

lingkungan fisik pembelajaran yang kurang kondusif, serta kesulitan dalam merancang aktivitas pembelajaran yang mampu mengembangkan keterampilan berpikir tingkat tinggi (Higher-Order Thinking Skills/HOTS). Oleh karena itu, penelitian ini merekomendasikan penguatan program pendidikan guru melalui pendekatan berbasis praktik, peningkatan infrastruktur sekolah praktikum, serta integrasi pengembangan profesional berkelanjutan yang bertujuan membekali pendidik dengan kompetensi abad ke-21. Temuan penelitian ini diharapkan dapat memberikan kontribusi bagi peningkatan program pendidikan guru serta menjadi bahan pertimbangan dalam perumusan kebijakan pendidikan yang mendorong transformasi pedagogis berpusat pada peserta didik.

Kata kunci: Pembelajaran Abad ke-21, Calon Guru, Pendidikan Bahasa Arab, Fasilitas Pendidikan, Praktik Pengalaman Lapangan

A. Introduction

The ongoing global transformation in education necessitates a comprehensive shift in teaching and learning approaches. Advances in digital technology, social evolution, and the dynamic demands of industry and society compel today's educators to nurture a generation of learners equipped with adaptable and future-ready skill sets. Within this context, 21st Century Learning (Pembelajaran Abad ke-21, PAK21) has emerged as a progressive pedagogical model designed to meet contemporary educational demands while fostering meaningful student engagement (Julaihi & Hamdan, 2020).

PAK21 emphasises mastery of the 4Cs which are communication, collaboration, critical thinking, and creativity, alongside the integration of values and ethics (Haniffa & Nor Azlah Sham Rambely, 2023). Through student-centred learning and the integration of digital technology, PAK21 encourages learners to actively participate in the learning process and develop higher-order thinking skills (Sunarto et al., 2023). In Arabic language education, this approach is particularly important because Arabic language learning requires students to actively communicate, collaborate, and apply language skills in authentic contexts rather than relying solely on memorisation and passive learning. Consequently, Arabic language teachers are expected to function not only as transmitters of knowledge, but also as facilitators who design meaningful and interactive learning experiences (Sutama et al., 2022).

However, despite the growing emphasis on PAK21, the implementation of this approach in Arabic language education remains limited, particularly among trainee teachers during practicum training. Existing studies mainly focus on the general implementation of PAK21 without specifically examining the realities, challenges, and readiness of Arabic language trainee teachers in practicum schools. This gap highlights the need for a more focused investigation into how PAK21

principles are applied within Arabic language classrooms and the factors influencing its effectiveness.

In Arabic language learning, students often face several challenges such as low confidence in speaking Arabic, limited opportunities for communication practice, weak mastery of vocabulary, passive classroom participation, and difficulties in applying grammatical knowledge in meaningful contexts (Azlan et al., 2021; Haniffa & Nor Azlah Sham Rambely, 2023; Hashim & Yunus, 2021). Traditional teacher-centred approaches, which heavily emphasise rote memorisation and grammar translation methods, have contributed to low student engagement and limited communicative competence. These issues demonstrate the need for PAK21 approaches that promote active learning, collaborative activities, digital learning tools, and student interaction to improve Arabic language acquisition and classroom engagement.

Nevertheless, trainee teachers often encounter difficulties in implementing such approaches effectively during their practicum. Among the major challenges are the mismatch between theoretical training at teacher education institutions and actual classroom realities, limited technological facilities in schools, and insufficient exposure to innovative Arabic language pedagogies such as project-based learning, collaborative learning, and technology-assisted instruction (Alias & Zainuddin, 2022; Dwi Purwaningtyas et al., 2024; Yusmar et al., 2023). As a result, many trainee teachers continue to depend on conventional teacher-centred instruction due to curriculum demands, time constraints, and limited practical experience in applying student-centred Arabic language teaching strategies (Putra et al., 2022).

Moreover, recent studies have found that teachers' proficiency in areas such as Technological Pedagogical Content Knowledge (TPACK), digital literacy, and contemporary pedagogical knowledge remains uneven (Gerald et al., 2017; Slamet et al., 2020). This situation creates a gap between theoretical understanding and actual classroom implementation of PAK21 in Arabic language education. Without continuous mentoring, reflective practice, and adequate technological support, trainee teachers may struggle to create engaging and interactive Arabic language learning environments.

Therefore, this study aims to assess the extent to which PAK21 principles are implemented by Arabic language trainee teachers during practicum, examine the readiness of practicum school facilities, and identify the factors that contribute to the development of 21st-century teaching competencies among trainee teachers. Unlike previous studies that discuss PAK21 implementation in general contexts, this study specifically focuses on Arabic language education and practicum experiences, thereby offering a more contextualised understanding of the challenges and needs faced by Arabic language trainee teachers. The findings are expected to contribute to the improvement of Arabic language teacher

education curricula and strengthen the implementation of PAK21 practices in Malaysian higher education institutions (Syamsuri et al., 2021; Tahim Bael et al., 2021).

The implementation of 21st Century Learning (PAK21) has become a central agenda in educational reform across Malaysia and the broader Southeast Asian region. A growing body of research highlights several interrelated factors that determine the success of PAK21 integration, particularly among Arabic language trainee teachers. These include pedagogical understanding and competence, technological readiness and infrastructure, the quality of professional training, and the extent of institutional support within practicum schools.

Effective implementation of PAK21 is strongly tied to teachers' mastery of student-centred pedagogical strategies. Julaihi and Hamdan (2020) assert that teacher awareness of 21st-century educational demands positively correlates with the degree of classroom implementation. Similarly, the present study finds that Arabic language trainee teachers exhibit moderate levels of engagement in inquiry-based learning, project-based learning, and cooperative learning hallmarks of the PAK21 framework.

Contemporary pedagogical frameworks such as Technological Pedagogical Content Knowledge (TPACK) and educational neuroscience are pivotal to deepening PAK21 practice (Dwi Purwaningtyas et al., 2024; Hussin & Nordin, 2023; Rivalina, 2020). However, inadequate exposure to contextualised and practice-based applications of these frameworks during training remains a persistent obstacle among Arabic language trainee teachers, particularly in applying communicative and interactive Arabic teaching strategies in real classroom settings. This finding reinforces prior literature which suggests that theoretical instruction alone is insufficient to foster pedagogical fluency without robust field-based training components (Kamarulzaman & Hassan, 2022; Khalid & Hashim, 2020; Syamsuri et al., 2021; Zainuddin & Mohamed, 2023).

Technology is an indispensable enabler of PAK21, yet numerous studies report significant barriers in its integration. The current research affirms that limited internet access and inadequate ICT infrastructure in practicum schools hinder the deployment of digital teaching strategies among Arabic language trainee teachers. Slamet et al., (2020) similarly argue that teachers require systematic training in the development and use of digital instructional materials, while Gerald et al., (2017) propose a PTPK-based competency framework for assessing teachers' ICT capabilities.

Innovative teaching methods such as Flipped Learning, gamification, and virtual laboratories have shown promise in enhancing learner engagement and mastery of 4C competencies (Nais et al., 2023; Putra et al., 2022; Sunarto et al., 2023). In Arabic language education, these approaches are particularly relevant for improving students' speaking confidence, vocabulary acquisition, listening

comprehension, and active classroom participation. Nonetheless, their success is conditional on the availability of conducive infrastructure, high digital literacy among educators, and a school culture that supports exploratory and collaborative learning.

A recurring theme in both national and regional studies is the infrastructural disparity across schools. The current study echoes previous findings by Raja Abdullah and Daud (2018), and Haniffa & Nor Azlah Sham Rambely, (2023), which highlight a lack of basic facilities such as projectors, flexible classroom layouts, and stable internet connectivity as significant impediments to PAK21 implementation among Arabic language trainee teachers. In many practicum settings, trainee teachers must adapt PAK21 strategies to fit resource-constrained environments, which ultimately limits opportunities for interactive Arabic language activities such as communication drills, collaborative learning, and technology-assisted language practice.

The situation is further complicated in secondary school Arabic language classrooms, where effective implementation of communicative language teaching, creative language activities, and student-centred tasks depends heavily on flexible learning spaces and adequate teaching aids (Gummah et al., 2024; Majid & Kamarulzaman, 2022; Sutama et al., 2022). These infrastructural needs extend to teacher education programmes, where practicum environments must mirror the conditions required for successful PAK21 execution.

Structured mentorship and sustained professional development are crucial to translating PAK21 from theory to practice. The present study identifies a significant gap in structured mentoring during practicum, consistent with the recommendations of Yusmar et al., (2023) and Syahmani et al., (2022). These studies stress that training models such as Project-Based Learning (PjBL) and STEM pedagogy must be accompanied by practical modules and mentor support to achieve their intended outcomes.

Moreover, ongoing teacher development should align with real classroom needs and incorporate diverse pedagogical models (Junedi et al., 2020; Marzuki & Musa, 2023; Omar & Said, 2021). For Arabic language trainee teachers, continuous mentoring is especially important in helping them adapt PAK21 strategies to language-based instruction, particularly in developing communicative competence, interactive classroom management, and meaningful Arabic language engagement among students. The current findings suggest that such approaches should be embedded as a core component of curriculum reform in teacher education institutions, thereby creating a cohesive bridge between training and teaching realities.

Although previous studies have extensively discussed PAK21 implementation, most research focuses on general subject areas or science and technology education, with limited emphasis on Arabic language teacher

education. Existing studies related to Arabic language teaching primarily examine students' motivation, language achievement, or general teaching methods, but rarely investigate how Arabic language trainee teachers implement PAK21 principles during practicum training. Furthermore, limited research specifically examines the interaction between pedagogical readiness, technological infrastructure, and 21st-century skill development within the context of Arabic language practicum classrooms.

Therefore, this study addresses these gaps by specifically focusing on Arabic language trainee teachers and examining three interconnected dimensions simultaneously: the implementation of PAK21 practices, the readiness of practicum school infrastructure, and the cultivation of 21st-century teaching competencies. This multidimensional focus offers a more contextualised and comprehensive understanding of the challenges faced by Arabic language trainee teachers during practicum, while also contributing new insights into the improvement of Arabic language teacher education programmes.

B. Method

This study employed a quantitative approach using a cross-sectional descriptive survey design to examine the implementation of 21st Century Learning (PAK21) among Arabic language trainee teachers during their practicum. The design was selected because it enables researchers to systematically measure the level of PAK21 implementation, assess practicum school readiness, and identify the development of 21st-century skills among trainee teachers in a structured and measurable manner, consistent with the objectives of the study.

The target population comprised 145 sixth-semester students enrolled in the Bachelor of Education (Arabic Language Education) programme at a public university in Malaysia who had completed Teaching Practicum I. From this population, a total of 103 respondents were selected using simple random sampling techniques. This sampling technique was chosen because each trainee teacher had an equal opportunity to be selected, thereby reducing sampling bias and enhancing the representativeness of the sample. In addition, the sample size was considered adequate to represent the population and support statistical analysis in descriptive survey research.

Data were collected using a structured questionnaire adapted from previous validated studies related to PAK21 implementation, teacher readiness, and 21st-century skills. The adaptation process involved modifying the questionnaire items to suit the context of Arabic language trainee teachers and practicum-based teaching environments. The questionnaire consisted of four sections with a total of 36 items:

Section A: Demographic information of respondents.

Section B: Implementation of PAK21 elements in teaching (14 items).

Section C: Readiness of practicum school facilities (10 items).

Section D: Development of 21st-century skills among trainee teachers (12 items).

The instrument employed a five-point Likert scale, namely:

1 = Strongly Disagree

2 = Disagree

3 = Moderate

4 = Agree

5 = Strongly Agree

The interpretation of mean scores was adapted from commonly used educational research interpretation guidelines, namely:

Low level: 1.00 – 2.33

Moderate level: 2.34 – 3.66

High level: 3.67 – 5.00

Before the actual data collection, the instrument underwent content validity evaluation by experts in Arabic language education and educational research methodology to ensure clarity, relevance, and suitability of the questionnaire items. A pilot study involving 30 Arabic language trainee teachers outside the main sample was subsequently conducted to test the reliability of the instrument. The Cronbach's alpha coefficient obtained was 0.87, indicating a high level of internal consistency and reliability.

Data collection was conducted after obtaining approval from the relevant faculty and participants. The questionnaires were distributed online using Google Forms to facilitate efficient data collection and increase respondent accessibility during the practicum period. Respondents were given sufficient time to complete the questionnaire voluntarily.

The collected data were analysed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistical analyses involving frequency, percentage, mean, and standard deviation were employed to examine the level of PAK21 implementation, practicum school readiness, and the development of 21st-century skills among Arabic language trainee teachers. The findings were interpreted according to the established mean score categories (low, moderate, and high) to ensure systematic and objective interpretation of the results.

Overall, the methodological procedures were carefully structured to ensure that the research design, sampling procedures, instrumentation, data collection, and data analysis were aligned with the objectives of the study and fulfilled the standards of quantitative educational research.

C. Results and Discussions

The findings of this study are presented according to the three principal constructs explored, namely: (i) the implementation of PAK21, (ii) practicum school facilities, and (iii) the cultivation of 21st-century skills among trainee

teachers. Data were collected via a 30-item questionnaire and analysed using descriptive statistics (mean and standard deviation), as shown in the following tables.

Table 1: Implementation of PAK21

Item	Statement	Mean	SD	Level
1	I implement student-centred learning activities.	3.68	0.65	High
2	I utilise technology in the teaching and learning process.	3.51	0.70	Moderate
3	I plan collaborative group activities.	3.45	0.67	Moderate
4	I apply inquiry-based learning methods.	3.30	0.74	Moderate
5	I guide students in applying higher-order thinking skills.	3.40	0.72	Moderate
6	I diversify teaching methods based on students' needs.	3.58	0.69	High
7	I use project-based learning strategies.	3.21	0.76	Moderate
8	I assign tasks that require student creativity.	3.48	0.71	Moderate
9	I provide students with autonomy in decision-making.	3.35	0.68	Moderate
10	I assess students' work using PAK21 rubrics.	3.22	0.73	Moderate

The findings in Table 1 indicate that the implementation of PAK21 among Arabic language trainee teachers was generally at a moderate level, with several elements reaching a high level. The highest mean score was recorded for student-centred learning activities ($M = 3.68$, $SD = 0.65$), suggesting that trainee teachers were relatively capable of shifting from traditional teacher-centred approaches to more active learning practices. Similarly, the diversification of teaching methods based on students' needs also achieved a high level ($M = 3.58$, $SD = 0.69$), reflecting trainee teachers' awareness of differentiated instruction in Arabic language teaching.

However, several important PAK21 practices remained at only a moderate level, particularly the use of project-based learning ($M = 3.21$, $SD = 0.76$), inquiry-based learning ($M = 3.30$, $SD = 0.74$), and assessment using PAK21 rubrics ($M = 3.22$, $SD = 0.73$). These findings suggest that trainee teachers may still experience difficulties in implementing more complex student-centred pedagogies consistently during practicum. In the context of Arabic language education, such limitations may reduce opportunities for students to actively engage in communicative tasks, collaborative learning, and higher-order language activities.

Table 2: Practicum School Facilities

Item	Statement	Mean	SD	Level
11	The school provides projectors or display screens.	3.12	0.80	Moderate
12	Internet access is easily available.	2.85	0.85	Low
13	Classrooms are suitable for group activities.	3.05	0.78	Moderate
14	ICT facilities are sufficient for teaching and learning activities.	2.90	0.82	Low
15	Modern teaching aids are readily usable.	3.10	0.75	Moderate
16	The school has flexible learning spaces.	2.98	0.79	Moderate
17	Facilities for printing teaching materials are available.	3.18	0.72	Moderate
18	ICT technical support is provided.	3.02	0.81	Moderate
19	The school has a well-equipped resource room.	3.15	0.77	Moderate
20	Infrastructure supports PAK21 activities.	3.00	0.74	Moderate

Table 2 demonstrates that the readiness of practicum school facilities was predominantly at a moderate level, with some aspects recorded at a low level. The lowest mean scores were observed for internet accessibility ($M = 2.85$, $SD = 0.85$) and ICT facilities ($M = 2.90$, $SD = 0.82$), indicating that technological infrastructure remains a major challenge in supporting the implementation of PAK21 during practicum.

These findings imply that Arabic language trainee teachers may face constraints in integrating digital teaching tools, online learning resources, and interactive language activities into their lessons. Limited internet access and insufficient ICT support can restrict opportunities for implementing technology-enhanced Arabic language learning activities such as multimedia presentations, online quizzes, collaborative platforms, and digital communication exercises. Consequently, the effectiveness of PAK21 implementation may be affected despite trainee teachers demonstrating positive pedagogical readiness.

Table 3: Cultivation of 21st-Century Skills

Item	Statement	Mean	SD	Level
21	I encourage students to engage in group discussions.	3.70	0.64	High
22	I assign tasks requiring critical thinking.	3.62	0.66	High
23	I encourage students to practise self-reflection.	3.55	0.69	Moderate
24	I train students in time management for task completion.	3.60	0.68	High
25	I promote collaborative problem-solving among students.	3.66	0.67	High
26	Students are given opportunities to present their work.	3.72	0.63	High
27	I provide space for students to express	3.58	0.70	High

	their opinions.			
28	I use activities that emphasise effective communication.	3.64	0.65	High
29	I assist students in setting personal learning goals.	3.49	0.71	Moderate
30	I use reflection on teaching and learning to enhance student competencies.	3.53	0.68	Moderate

The findings in Table 3 reveal that the cultivation of 21st-century skills among students was generally at a high level. The highest mean score was recorded for providing students opportunities to present their work ($M = 3.72$, $SD = 0.63$), followed by encouraging group discussions ($M = 3.70$, $SD = 0.64$). These findings demonstrate that Arabic language trainee teachers were able to foster communication and collaboration skills effectively within classroom activities.

In addition, activities emphasising critical thinking, collaborative problem-solving, and effective communication also recorded high levels, indicating that trainee teachers were increasingly integrating the 4Cs elements into Arabic language teaching practices. This reflects positive progress in promoting more interactive and student-centred Arabic language classrooms compared to conventional memorisation-based approaches. Nevertheless, aspects related to self-reflection and personal learning goal-setting remained at a moderate level, suggesting that reflective learning practices among students still require further enhancement.

Overall, the findings indicate that Arabic language trainee teachers demonstrated satisfactory levels of PAK21 implementation and showed strong efforts in cultivating 21st-century skills among students. However, the implementation was not yet fully optimal due to several constraints, particularly limitations in school infrastructure and technological support. The findings also suggest that trainee teachers were more confident in implementing basic collaborative and communicative activities than in applying more advanced pedagogical approaches such as project-based and inquiry-based learning.

From a broader perspective, these results highlight the importance of strengthening practicum support systems, improving ICT infrastructure in schools, and providing continuous pedagogical training for Arabic language trainee teachers. Such improvements are necessary to ensure that PAK21 implementation in Arabic language education can be carried out more comprehensively, effectively, and consistently in line with contemporary educational demands.

Discussions

The findings of this study provide important insights into the implementation of 21st Century Learning (PAK21) among Arabic language trainee teachers in a Malaysian public higher education institution. Overall, the results indicate that trainee teachers demonstrated moderate to high levels of PAK21 implementation, particularly in communication and collaborative learning

activities. However, several pedagogical and infrastructural constraints continue to affect the effectiveness of implementation. The discussion focuses on three key aspects: pedagogical implementation, practicum school readiness, and the development of 21st-century skills.

Pedagogical Implementation of PAK21

The findings showed that Arabic language trainee teachers demonstrated relatively high engagement in student-centred learning activities ($M = 3.68$) and diversified teaching approaches based on students' needs ($M = 3.58$). These findings support previous studies by Julaihi & Hamdan (2020) and Haniffa & Nor Azlah Sham Rambely (2023), which suggest that trainee teachers are increasingly aware of the importance of student-centred pedagogy in 21st-century classrooms.

However, the implementation of more advanced PAK21 strategies such as project-based learning ($M = 3.21$) and inquiry-based learning ($M = 3.30$) remained at a moderate level. This finding extends earlier research by Alias and Zainuddin, (2022) and Zainuddin and Mohamed (2023), which reported that trainee teachers often struggle to translate theoretical understanding into practical classroom application due to time limitations, curriculum demands, and limited practicum exposure. In the context of Arabic language education, these constraints may contribute to continued dependence on teacher-centred and grammar-focused instruction.

The findings therefore suggest that although Arabic language trainee teachers possess basic pedagogical awareness of PAK21, they still require systematic exposure to practical teaching strategies that emphasise communication, collaborative learning, and authentic language use. This indicates that teacher education programmes should place greater emphasis on applied pedagogical training rather than relying predominantly on theoretical instruction.

Practicum School Infrastructure and Readiness

The study also found that practicum school facilities were generally at a moderate level, with internet accessibility ($M = 2.85$) and ICT facilities ($M = 2.90$) recording the lowest scores. These findings are consistent with Gerald et al., (2017) and Syamsuri et al. (2021), who identified technological and infrastructural limitations as major barriers to effective PAK21 implementation. The current findings support the argument that insufficient technological resources directly affect trainee teachers' ability to integrate digital learning tools and interactive teaching approaches into classroom practice.

In Arabic language education, limited ICT facilities reduce opportunities for trainee teachers to implement multimedia-based language instruction, online communication exercises, and interactive collaborative tasks. Consequently, many trainee teachers may simplify or avoid technology-integrated learning activities despite recognising their importance within PAK21 practices.

The findings highlight that infrastructural readiness is not merely a supporting factor but a prerequisite for effective PAK21 implementation. Without adequate internet access, flexible learning spaces, and technological support, trainee teachers may encounter difficulties in fully applying student-centred and technology-enhanced Arabic language teaching approaches.

Development of 21st-Century Skills

The results demonstrated that trainee teachers successfully cultivated several 21st-century skills among students, particularly through group discussions ($M = 3.70$), opportunities for presentations ($M = 3.72$), collaborative problem-solving ($M = 3.66$), and communication-focused activities ($M = 3.64$). These findings support the literature by Rivalina, (2020) and Sunarto et al. (2023), which emphasise that collaborative and communicative classroom activities are essential components of effective PAK21 implementation.

Nevertheless, reflective learning practices and personal learning goal-setting remained at only moderate levels. This suggests that while trainee teachers were able to facilitate surface-level collaboration and participation, deeper reflective and self-regulated learning practices were less consistently implemented. This finding extends previous studies by Sari and Yarza, (2022), who argued that reflective learning requires continuous mentoring and structured pedagogical guidance during practicum.

Overall, the findings indicate that Arabic language trainee teachers were more confident in implementing communicative and collaborative classroom activities than in fostering reflective and inquiry-oriented learning. This suggests the need for greater emphasis on higher-order thinking, reflective learning strategies, and learner autonomy within Arabic language teacher training programmes.

Mentorship and Professional Development

Another significant finding relates to the need for continuous mentorship and professional development during practicum. The moderate implementation of advanced PAK21 strategies indicates that trainee teachers may not receive sufficient practical guidance during teaching practice. This finding supports Yusmar et al. (2023) and Syahmani et al. (2022), who emphasised that mentoring and practical support are essential for strengthening trainee teachers' confidence and pedagogical competence.

The findings suggest that mentorship should move beyond administrative supervision and focus more specifically on classroom pedagogy, reflective practice, and technology integration. In practical terms, teacher education institutions could strengthen mentoring systems by providing structured observation instruments, regular reflective discussions, collaborative lesson planning sessions, and targeted workshops on digital Arabic language teaching strategies.

Implications for Arabic Language Teacher Education

This study contributes to the field of Arabic language teacher education by demonstrating that the implementation of PAK21 among Arabic language trainee teachers is influenced not only by pedagogical readiness, but also by infrastructural support and mentoring quality. The findings support previous concerns raised by Azlan et al. (2021), Hashim and Yunus, (2021) regarding the continued dominance of traditional teaching approaches in Arabic language classrooms.

Based on the findings, several practical improvements can be proposed. First, teacher education institutions should strengthen practicum-based pedagogical training by incorporating more classroom simulations, project-based instruction, and digital teaching applications specifically tailored to Arabic language education. Second, practicum schools should improve technological facilities and internet accessibility to support interactive learning activities. Third, mentoring systems should be enhanced through continuous pedagogical coaching and reflective supervision to help trainee teachers implement PAK21 more confidently and consistently.

In conclusion, the study demonstrates that although Arabic language trainee teachers show positive readiness toward PAK21 implementation, the effectiveness of implementation remains dependent on continuous pedagogical support, adequate infrastructure, and structured practicum mentoring. Strengthening these aspects is essential to ensure that Arabic language education can meet the demands of 21st-century teaching and learning.

D. Conclusions

This study examined the implementation of 21st Century Learning (PAK21) among Arabic language trainee teachers by focusing on three main aspects: the implementation of PAK21 practices, practicum school readiness, and the cultivation of 21st-century skills. The findings showed that the overall implementation level was moderate, indicating that trainee teachers possessed basic awareness and understanding of PAK21 but still encountered challenges in applying more advanced student-centred approaches consistently during practicum.

The study found that collaborative and communication-based activities were more frequently implemented compared to inquiry-based, reflective, and project-based learning approaches. In addition, limitations in ICT facilities, internet accessibility, and pedagogical support were identified as significant factors affecting the effectiveness of PAK21 implementation in Arabic language classrooms. These findings demonstrate that successful implementation of PAK21 depends not only on trainee teachers' pedagogical readiness, but also on infrastructural support and continuous professional guidance.

In relation to the research objectives, this study successfully identified the level of PAK21 implementation among Arabic language trainee teachers, examined the readiness of practicum school facilities, and analysed the development of 21st-century skills during practicum. The study also contributes a more contextualised understanding of PAK21 implementation specifically within Arabic language teacher education, an area that remains relatively underexplored in previous research.

Based on the findings, several key recommendations are proposed:

1. Teacher education institutions should strengthen practicum-based training through more structured exposure to project-based, inquiry-based, and technology-assisted Arabic language teaching strategies.
2. Practicum schools should improve ICT infrastructure and internet accessibility to support student-centred learning activities effectively.
3. Continuous mentoring and reflective supervision should be enhanced to help trainee teachers apply PAK21 approaches more confidently and consistently during practicum.

Overall, this study highlights the importance of integrating pedagogical training, infrastructural readiness, and professional mentorship in strengthening PAK21 implementation among Arabic language trainee teachers. The findings provide both practical and theoretical contributions by offering a more comprehensive understanding of the factors influencing PAK21 implementation within the context of Arabic language teacher education in Malaysia.

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