International Journal of Evaluation and Research in Education (IJERE)
Vol. 14, No. 1, February 2025, pp. 250~259
ISSN: 2252-8822, DOI: 10.11591/ijere.v14i1.24863

Acceptance of 21st century elements education among teachers in Malaysia

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Article Info

Article history:

Received Jun 28, 2023
Revised Aug 13, 2024
Accepted Sep 2, 2024

Keywords:

21st century education
Attitudes
Knowledge
Literacy
Practices

ABSTRACT

Malaysia's education development plan 2013-2025 promotes 21st-century learning. Instruction, learning, and school assistance are the key focus. This study selected Rompin State instructors to assess their 21st-century education ability, perspective, and application. The questionnaire was the main data-gathering tool in this quantitative investigation. Standard random sampling chose 152 school teachers. This study used Pearson correlation and t-test for descriptive and inferential analysis. The results showed reasonable knowledge, attitude, and practices (mean=2.95, standard deviation=0.22, 2.94, 0.23, 2.90, 0.29). The t-test showed significant differences in knowledge (t=-2.11, df=157, p 0.05) and attitude (t=-2.26, p 0.05) but not in practice (t=-1.81, p>0.05). Using Pearson correlation analysis, knowledge, and behaviors were moderately positively correlated (r=0.677, p<0.01), whereas attitudes and practices were strongly positively correlated (r=0.837, p<0.1). Teachers have modest knowledge, attitudes, and practices. Teachers must frequently take short courses to improve their 21st-century education. Mandatory authorities and scholars will help instructors professionally grasp 21st-century education. This study found that teachers with 21st-century education literacy can improve their knowledge, attitude, and practice and regularly apply it to their teaching.

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1. INTRODUCTION

Currently, in education, a range of initiatives, techniques, and strategies are employed to enhance students' cognitive abilities during teaching, learning, and facilitating (TLF) sessions within a school. When conducting TLF in a school, it is important to consider the suitability and requirements of students belonging to high, medium, or low-ability groups. The TLF technique requires a more efficient transformation process to stimulate students' more profound enthusiasm for learning. The country's primary obstacle is cultivating a sophisticated, knowledge-driven economic structure to contend with other nations effectively. The education sector necessitates robust assistance in cultivating astute and proficient Malaysians throughout diverse disciplines. Thus, 21st century learning, also known as *Pembelajaran Abad ke-21* (PAK21), has emerged as a novel period in assisting educators in incorporating skills that align with the evolving demands of the nation [1]–[6].

As per the Malaysia Education Service Commission, teachers constitute one of the major professions in Malaysia and have a crucial impact on the overall welfare of Malaysian society. Traditionally,

teachers have been acknowledged as valuable human resources with an excellent education, a strong sense of self, expertise, moral integrity, extensive knowledge, and exceptional abilities to fulfill the educational requirements of the nation. Teachers of this caliber can cultivate exceptional persons [7]. Malaysians typically undergo six years of primary school education, followed by five years in secondary school. Therefore, the teacher substantially impacts an individual's development and overall welfare throughout eleven years. Creţu [8] asserted that teachers are of utmost significance and are the primary impetus behind the entire educational apparatus. The government has implemented multiple initiatives to enhance the teaching profession.

This article discusses the various learning components based on the five constructs of PAK21, which include critical thinking, communication, teamwork, creativity, moral ideals, and ethics. The Ministry of Education (MOE) Malaysia has identified various skills as the foundation of the TLF. These abilities include learning and innovation, media literacy, information technology proficiency, and life and career skills. In addition, there are ten additional components of 21st-century skills: creativity and innovation, critical thinking and problem-solving, communication and collaboration, information literacy, technological literacy, information and communication technology, flexibility and adaptability, initiative and self-direction, social skills, and culture, productivity, and accountability, as well as leadership and responsibility [9]. The implementation of PAK21 will also enhance endeavors to increase the community's productivity. Moreover, these talents are important for many advances in the contemporary global sphere.

Knowledge encompasses the information acquired through firsthand experience, formal education, and careful observation of the senses. Knowledge is the primary factor influencing an individual's actions [10]. This study primarily focused on examining instructors' understanding of 21st-century education. A profound level of expertise is essential for teachers to carry out their duties. Several studies contend that the extent of knowledge influences one's inclination to respond in various scenarios. According to a study conducted by Safri and Jamaludin [7], the findings indicated that the majority of teachers in the chosen schools in the Kota Bharu Region of Kelantan possess a significant understanding of PAK21, with a percentage of 57% (M=5.38, SP=0.64). The study results indicate that knowledge factors substantially influence teachers' teaching techniques. Teachers with a profound understanding of PAK21 knowledge will significantly enhance their teaching practice. Teaching practice is crucial since it enhances teachers' collaboration, concentration, and dedication to sustain their service.

Meanwhile, Mustakim *et al*. [11] discovered that Islamic education instructors in Selangor State secondary schools significantly understood multimedia, one part of PAK21. The mean value (M=4.24, SP=0.38) indicates this high level. Teachers unanimously acknowledged that multimedia incorporates a captivating blend of text, voice, animation, graphics, and interactive media, scoring the highest average rating (M=4.77, SP=0.43). Howard [12] stated that PAK21 employs information communication technology (ICT). Teachers should acquire holistic consumer pedagogy abilities, utilizing multi-modal learning models incorporating creative, inventive, critical technology concepts and reasoning [13]. According to the research conducted by Kaur [14], the degree of understanding among mathematics teachers about the implementation of PAK21 is high. Approximately 73% of teachers comprehensively understand all the specific components and requirements associated with PAK21.

According to McLure *et al*. [15], attitude is a psychological condition that characterizes an individual's potential response to something. Howard [12] argued that teachers in the 21st century must possess a receptive mindset towards technology, perceiving it as a beneficial tool. Additionally, they should actively stay informed about existing and emerging concerns to enhance their knowledge and skills continuously. Teachers must also embody core values to transform themselves into educators of the 21st century. In order to fulfill their role as exemplary educators, teachers must possess commendable professional, social, and personal attributes.

McLure *et al*. [15] asserted that educators must exhibit positivity and ingenuity in employing TLF strategies that are more applicable to the practical implementation of the 21st century education transformation plan (PAK21). Teachers should adapt by prioritizing individual attributes, including attitudes, talents, and a more optimistic mindset [16], [17], allowing them to cultivate their attitude towards implementing PAK21 and consistently applying PAK21 in the classroom. According to the research by Mohamad and Mustapha [18], they used descriptive statistical analysis. Regarding attitude, the average preparedness of trainee teachers specializing in history in the sixth semester of the IPG Southern Zone was 4.29 (SD=0.36). In comparison, the average readiness of trainee teachers specializing in history in the eighth semester was 4.27 (SD=0.50). The findings indicate that the attitude of the trainee teachers specializing in history in semester 6 is superior to those specializing in history in semester 8. Nevertheless, these two groups maintain a significant level of attitude.

Practice refers to an individual's response to anything using methods, techniques, strategies, and procedures [19]. According to Kaliyaperumal [20], "practice" refers to how individuals showcase their knowledge through their behaviors. When an individual possesses profound expertise in a particular subject,

implementing positive strategies will foster consciousness [20]. Valente *et al.* [21] argue that regularly engaging in a setting and acquiring new knowledge will elicit a favorable attitude. Practice can also be defined as a virtuous act or philanthropy engagement [22]. The study conducted by Safri and Jamaludin [7] revealed that a majority of teachers in the selected schools in Kota Bharu, Kelantan, exhibit a significant degree of PAK21 practice, with 61.1% (M=5.14, SP=0.66). This study additionally discovered that implementing PAK21 leads to a positive student learning experience and satisfies teachers in applying TLF. Teachers participating in PAK21-related courses will have greater opportunities to apply PAK21 principles in each TLF. The study conducted by Muhamad *et al.* [23] examined the level of 4K 1N practice, one of the five aspects of PAK21, among teachers in the Northern Zone Basic Vocational Education (PAV) program. The findings revealed that Northern Zone PAV instructors' 4K 1N practice level was high, with a mean score of 4.28. However, the creative aspect achieved an essential mean score of 3.82 based on the 4K 1N element. The average score for the critical thinking component was M=3.86, while the average score for the collaborative component was M=3.94. These three elements are at a modest level. Simultaneously, the communication element attained a significantly high mean score of 4.14. Hence, PAV teachers must comprehensively understand the PAK21 idea and exhibit enhanced self-assurance in their abilities.

According to the research conducted by Yusof [1], the average score for the overall elements of PAK21 practice among educators is moderate, with a mean of 3.43 and a standard deviation of 0.46. The elements of critical thinking (M=3.32), reflection (M=3.37), technology (M=3.34), and creativity and invention (M=3.37) should be improved as they currently fall below the general mean at a moderate level. Hence, it is imperative for teachers, particularly those in Rompin, Pahang, to acquire the necessary knowledge and have the appropriate attitude to effectively execute the PAK21 practice by utilizing the methodologies outlined in PAK21. Prior research indicates that when there is reduced emphasis on implementing PAK21 among educators, their level of understanding and attitude also tends to be low. Hence, this study aims to establish the correlation between the previous study and the current investigation on the interplay of knowledge, attitude, and practice in the teaching, learning, and supervisory processes of 21st-century education among teachers in Malaysia.

2. METHOD

This study employs quantitative methodologies through the utilization of a survey instrument. A questionnaire is considered one of the most effective approaches to gathering primary data from extensive populations using sampling techniques [24] as employed in this work. This study employs a questionnaire to assess the extent of knowledge, attitudes, and practices of PAK21 among teachers in specifically chosen schools within the Rompin District of Pahang. The questionnaire was created and disseminated using PAK21 knowledge, attitudes towards PAK21, and practices associated with PAK21. The study utilized a t-test analysis to assess the disparities in PAK21 knowledge, attitudes, and behaviors based on gender. A Pearson correlation was also employed to investigate the associations between the three components of knowledge, attitudes, and practices examined. This study selected four secondary schools in Rompin, specifically Rompin National Secondary School, Pahang Religious National Secondary School, Tanjung Gemok National Secondary School, and Selendang National Secondary School.

2.1. Sampling and study instruments

The aggregate number of educators in four specifically chosen schools within the Rompin District of Pahang is 247 individuals. Hence, the sample size for the random selection in four schools is 159, as indicated in the sample size determination table by Krejcie and Morgan [25]. Out of the entire group, there are 43 male and 116 female teachers. The number is attributed to the significant presence of female teachers in the research area. In this scenario, it is not feasible to determine an equal number of samples from each category. Furthermore, as stated by Krejcie and Morgan [25], the proportion of male and female teachers may not be equal and is contingent upon the data gathered throughout the data collection process.

Table 1 provides a concise overview of the structure and components of the questionnaires. The questionnaire is divided into five sections. Section A examines the demographic characteristics of the respondents, including their educational background, age, gender, race, marital status, subjects taught, teaching experience, position in school, most significant degree of education, and the last educational institution attended. Simultaneously, Section B encompasses knowledge related to 21st-century schooling. Section C pertains to the attitudes towards education in the 21st century, whereas Section D elucidates the practices related to education in the 21st century as reported by the respondents. Section E encompasses the respondents' comments and ideas about the researched subjects.

Table 1. Segmentation of questionnaire

Section	Description	# of items	Item #	Item sources
A	Respondent profiles	10 items	1 to 10	Researchers
B	PAK21 knowledge	20 items	5, 7, 8, 13, 14 and 15	Researchers
	- Pedagogical knowledge	(5 points	6 and 16	Pérez-Jorge *et al.* [26]
	- Content knowledge	Likert Scale)	9 to 12	Modified from Pérez-Jorge *et al.* [26]
	- General knowledge		1 to 4 and 17 to 20	Modified from Julaihi and Hamdan [27]
	- Teaching specialist knowledge			
C	PAK21 attitudes	20 items	1 to 20	Pérez-Jorge *et al.* [26]
	- Teacher professionalism	(5 points		
	- Innovation in teaching and learning	Likert Scale)		
D	PAK21 practices	20 items	5, 7, 8, 13, 14 and 15	Researchers
	- ICT skill	(5 points	6 and 16	Pérez-Jorge *et al.* [26]
	- Pedagogy skill	Likert Scale)	9 to 12	Modified from Pérez-Jorge *et al.* [26]
	- Convey an idea		1 to 4 and 17 to 20	Modified from Julaihi and Hamdan [27]

A pilot research is conducted to evaluate the reliability of the study variables using Cronbach's alpha values, as described by Bond and Fox [28]. Table 2 displays the reliability measure of educational research items in the 21st century, as perceived by teachers in Rompin District, Pahang. The items in this questionnaire were assessed using the Likert scale, a system that assigns scores ranging from 1 to 5. In this study, the Likert scale assesses individuals' responses to a particular stimulus through positive and negative words. The study examines individuals' knowledge and attitudes towards 21st-century education using a Likert scale of five: 1=strongly disagree, 2=disagree, 3=no comment, 4=agree, and 5=strongly agree. Furthermore, contemporary teaching methodologies in the 21st century are assessed using alternative Likert scales, specifically 1=never, 2=sometimes, 3=occasionally, 4=often, and 5=very often. This questionnaire was used to evaluate the knowledge, attitudes, and behaviors related to education in the 21st century.

The gathered data were analyzed using the statistical package for the social sciences (SPSS) software. This article primarily aims to ascertain the extent of instructors' knowledge, attitudes, and behaviors about 21st-century education. The statistical data analysis provides a quantitative representation of the frequency of discoveries by using mean and percentage values to measure the degree of knowledge, attitudes, and practices in 21st-century education. This study utilizes inferential analysis (t-test) to evaluate if there are significant variations among specific groups, specifically teachers' gender, with the variables examined, including knowledge, attitudes, and practices of 21st-century education. This study also investigates the correlation between teachers' knowledge and attitudes regarding educational procedures in the 21st century. The Pearson r correlation technique benchmark was set at a significance level of $p<0.05$.

Table 2. Reliability value of study variables

Section	Variables	# of Items	Value of Cronbach alpha	Reliability interpretation
B	Knowledge	20	0.900	Very good
C	Attitudes	20	0.903	Very good
D	Practices	20	0.924	Very good

3. RESULTS AND DISCUSSION

A total of 152 participants were chosen from Rompin National Secondary School. There are 116 female responses, accounting for 73% of the total, and 43 male respondents, making up 27%. The bulk of respondents, comprising 145 individuals (91.2%), are married, while 14 individuals (8.8%) are single. The study mainly engaged the Malays, with 96.2% of the sample size of 153 students. The Sabah Bumiputera and Bumiputera Sarawak groups accounted for 1.3% with two respondents. The Indian and Chinese participants each represented 0.6% with one individual. The most enormous number of respondents, accounting for 66.7% or 106 individuals, have a teaching experience of 11 years or more. Most respondents, 93.7% or 149 individuals, are teachers from Malaysia's Public Institutes of Higher Learning (PIHL).

3.1. Levels of knowledge, attitudes, and practices of 21st century education among school teachers

The outcomes of this study utilized a descriptive-analytic approach to determine the mean score, standard deviation, and level of variables based on responses from instructors in the Rompin District, Pahang. Table 3 revealed that the overall degree of knowledge was moderate, with a mean of 2.95 and a standard deviation of 0.22. Therefore, most teachers possess a satisfactory level of understanding regarding 21st-century education. This study aligns with the findings of study Ali [29], which demonstrated that a high level of understanding of PAK21 is crucial for the effective implementation of PAK21. Nevertheless, the

survey also revealed that teachers must enhance their understanding of PAK21 concepts, such as critical thinking and creativity. In addition, according to the data presented in Table 3, the results indicate that instructors' degrees in 21st-century educational attitudes are moderate, with a mean score of 2.94 and a standard deviation of 0.23. The instructors in the Rompin region of Pahang have a moderate and less welcoming stance towards 21st-century education. The results suggest that some teachers do not provide positive feedback to the questions emphasized in this questionnaire on 21st-century education.

Table 3 displays the extent of 21st-century educational methods employed by instructors in the Rompin area, indicating a moderate average level (M=2.90, SP=0.29). The findings indicated that 151 participants (95.0%) possessed substantial knowledge, whereas just eight (5.0%) participants had a modest knowledge of 21st-century education. The teachers in four chosen schools within the Rompin District possess a commendable degree of expertise that enables them to acquire diverse and up-to-date information regarding educational matters in the 21st century. This study is consistent with the research conducted by Yusof [1]. The average of all the PAK21 elements of educators is (M=3.43, SP=0.46). The critical thinking skills (M=3.32), reflection skills (M=3.37), technological skills (M=3.34), and creativity and invention abilities (M=3.37) need improvement as they are now at a modest level. The knowledge exchange between teachers and students or among students characterizes collaborative learning. This includes exchanging internet search results and utilizing their creativity to accomplish assigned tasks.

Table 3. Variable levels of 21st century educational knowledge, attitudes, and practices

Variables	Low level		Moderate level		High level		Mean	SD	Average level
	#	%	#l	%	#	%			
Knowledge	0	0	8	5.03	151	94.97	2.95	0.219	Moderate
Attitudes	0	0	9	5.66	150	94.34	2.94	0.232	Moderate
Practices	0	0	6	3.77	153	96.23	2.90	0.293	Moderate

These study findings are consistent with the conclusions of Fadzillah *et al.* [30]. The researchers discovered that the proficiency of Kuala Lumpur technical secondary school teachers in using computers in PAK21 is at a modest level. While most instructors have been trained in PAK21, some teachers still lack the skills to administer TLF based on PAK21 effectively. Nevertheless, the findings of this investigation contradict the research conducted by Mustakim *et al.* [11]. The investigation revealed that Islamic Education Teachers (GPI) in Selangor State Secondary Schools have a high degree of understanding of using multimedia to teach PAK21 Islamic education. The overall mean value was 4.24, with a standard deviation of 0.38. The outcome unequivocally demonstrates that the GPI of Selangor State Secondary School possesses a fundamental comprehension of multimedia and its application in PAK21. A study conducted by the Ministry of Education (MOE) [9] found that the adoption of PAK21 among mathematics teachers is extensive, with 73% of teachers demonstrating comprehensive knowledge of all the distinct components and requirements associated with PAK21.

Therefore, teachers have a humble demeanor yet are less preoccupied with 21st-century education. This study's findings align with the research conducted by Kamaruddin *et al.* [31], which concluded that the preparedness of instructors, namely in terms of their attitude towards integrating information technology in PAK21, is a crucial determinant of the success and efficacy of ICT utilization in TLF. The study by Kamaruddin *et al.* [31] reveals that Islamic education instructors have a moderate attitude despite their limited multimedia knowledge. This is attributed to the preference of Islamic education teachers for traditional teaching techniques. The demeanor of a humble instructor is evident, particularly among educators with limited expertise. Nevertheless, educators participating in ICT and PAK21 courses significantly influence their passion and motivation to utilize multimedia in TLF.

3.2. Differences in knowledge, attitudes, and practices based on teacher gender regarding 21st century education

This study utilized inferential analysis through a t-test to evaluate if there were significant variations across specific groups, specifically teachers' gender, with the variables examined, including knowledge, attitudes, and practices of 21st-century education. An experiment was conducted to test the null hypothesis regarding the disparities in knowledge between male and female teachers in 21st-century education. The hypotheses that will be examined are as: There is no discernible disparity in the knowledge regarding 21st-century education between male and female teachers (Ho1). The p-value of less than 0.05 was deemed adequate, indicating statistical significance in the t-test. When the standard deviation value of a bigger group achieves a significance level of $p<0.05$, it indicates a statistically significant difference between males and females [32]. The study found significant gender differences in knowledge between males (M=4.22,

SP=0.45, n=43) and females (M=4.37, SP=0.39, n=116), with males having a lower average score. This difference was statistically significant (t=2.11, df=157, p<0.05). Therefore, the null hypothesis suggests no statistically significant difference in 21st-century education expertise between male and female rejected teachers. Hence, there exists a disparity in the knowledge possessed by male and female instructors, with female teachers exhibiting a superior level of expertise in 21st-century education and consistently demonstrating sensitivity toward contemporary challenges on PAK21. The study by Ali [29] presented findings that opposed the notion, as it did not demonstrate any disparities in instructors' comprehension of general knowledge and the five elements of PAK21 depending on gender. The results indicated that the t-test value obtained was 1.038, and the significance level was 0.300 (p<0.05). Consequently, there was no notable disparity in the level of general knowledge comprehension of PAK21 based on gender. In this study, a sample size of 307 was used. Female instructors had a higher average value of 4.23, whereas male teachers had an average of 4.18. Despite a slight disparity in the average, both values remain elevated.

A null hypothesis was utilized to ascertain disparities in PAK21 attitudes between male and female educators. The study's hypotheses are as: There is no discernible disparity in the attitudes towards 21st-century education between male and female teachers (Ho2). The data presented in Table 4 indicates a noteworthy distinction between males (mean=4.21, standard deviation=0.49, sample size=43) and females (mean=4.39, standard deviation=0.41, sample size=116), as evidenced by the t-test result (t=-2.26, degrees of freedom=157, p-value <0.05). The null hypothesis, which suggests no significant variation in attitudes linked to PAK21 based on gender among instructors, has been rejected. Consequently, there exists a notable disparity in the attitudes of male and female instructors towards PAK21, with female teachers displaying a greater emphasis on views on PAK21.

Furthermore, a t-test is employed to examine the disparities in the educational practices of instructors in chosen schools in the Rompin District during the 21st century. A null hypothesis was examined to ascertain the disparities in educational practices in the 21st century between male and female teachers. The study's hypotheses are as: There is no discernible disparity in the water conservation strategies of instructors based on gender (Ho3). The data presented in Table 4 indicate no statistically significant difference between males (mean =4.25, standard deviation =0.52, sample size =43) and females (mean =4.40, standard deviation =0.44, sample size =116). Specifically, the t-test yielded a t-value of -1.81 with 157 degrees of freedom, and the p-value was more than 0.05. Based on this inferential statistical analysis, the null hypothesis, which suggests no substantial variations in teaching practices in 21st-century education based on gender among teachers, was accepted (not rejected). While there is no notable disparity between male and female teachers, statistical data indicates that both genders demonstrate equal proficiency in implementing 21st-century education in each TLF.

Table 4. Teacher gender differences in the variables of knowledge, attitude, and practice

Variables	Sex	N	Mean	SD	df	*t*	*p*
Knowledge	Male	43	4.22	0.45	157	-2.11	0.04
	Female	116	4.37	0.39			
Attitudes	Male	43	4.21	0.49	157	-2.26	0.03
	Female	116	4.39	0.41			
Practices	Male	43	4.25	0.52	157	-1.81	0.07
	Female	116	4.40	0.44			

These findings align with the research conducted by Hanapi *et al*. [33] regarding the attitudes of Malay language teachers while selecting a fuel. The findings revealed a disparity in the disposition of males and females towards utilizing the internet in Bahasa Melayu. The t-test study of the attitudes of men and women towards Internet usage in Bahasa Melayu revealed a p-value of 0.015, below the significance level of 0.05. Female professors had a higher frequency of teaching aid (TA) usage compared to their male counterparts in the study. PAK21 should ensure that there are no gender disparities in the choice of fuel consumption. Teachers in the 21st century must master the latest media and IT abilities and utilize them to enhance the quality of teaching and learning in the classroom. The results align with a study by Mohamad and Ahmad [34], which concluded no statistically significant disparity in the average utilization of teaching aids in TLF between male and female teachers. The average result in this investigation was p=0.274 (p=0.274>0.05).

Nevertheless, this study contradicts the findings of Hanapi *et al*. [33] research on the choice of BBM, specifically the utilization of PAK21. Jeffery's study employed a t-test to compare the views of male and female teachers, yielding a t-value of 0.52 and a p-value of 0.24. The significance level was statistically greater than 0.05 (p>0.05). Consequently, there is no substantial disparity in the average attitude of male teachers (M=3.93, SD=0.27) and female teachers (M=4.00, SD=0.24) about using teaching aids in the Bahasa

Melayu. Jeffery's study [35] contradicts the usage of gasoline, which is a requirement of PAK21, among technical school teachers in the states of Melaka and Selangor. The study revealed that male and female professors strongly favor using fuel in PAK21. However, the data indicates that most respondents are highly interested in utilizing computer-based systems, notwithstanding infrequent usage. Technical disruptions and limited implementation time for PAK21 using fuel are among the reasons that impede energy utilization.

3.3. The correlation between teachers' knowledge and attitudes toward 21st-century educational practice

The study employed Pearson correlation coefficient analysis to examine the association between the knowledge, attitudes, and practices of 21st-century education among teachers in selected schools in Rompin, Pahang. The purpose of this analysis was to address the third objective and question of the study and to examine and evaluate Ho's research hypotheses. The study hypothesis for the third research question aims to determine the extent of the relationship between the degree of knowledge, attitudes, and practices of 21st-century education among instructors in chosen schools. Employed to evaluate the subsequent conjectures Ho (4): There is no discernible correlation between teachers' level of expertise and their use of 21st-century educational techniques.

Table 5 demonstrates a moderate correlation between the level of knowledge and the implementation of 21st-century educational techniques among instructors in specifically chosen schools in the Rompin District. The correlation coefficient (r=0.677) indicates a moderate and statistically significant positive association between the amount of knowledge in 21st-century education and the implementation of 21st-century educational practices. In addition, there is a statistically significant association ($p<0.01$) between the amount of knowledge in 21st-century schooling. Thus, the Pearson correlation analysis results rejected the null hypothesis Ho (4), indicating a substantial relationship between the degree of knowledge and 21st-century educational practices among teachers in selected schools in the district of Rompin. The discovery elucidating the limited comprehension of 21st-century educational methodologies among teachers remains valid, although it has not yet attained optimal utilization of PAK21 in every TLF.

Furthermore, this study examines the correlation between attitudes and educational practices of teachers in selected schools in the Rompin District, Pahang, in the context of the 21st century. This analysis examines hypothesis Ho (5) to the third research question: How strong is the correlation between the degree of knowledge, attitudes, and practices of 21st-century education among teachers in selected schools in the Rompin District, Pahang? The hypothesis Ho (5) to be tested is as: There is no discernible correlation between the level of attitude and 21st-century educational practice among teachers. Table 5 displays the findings of the Pearson correlation analysis, indicating a strong and statistically significant association (r=0.837) between attitude levels and 21st-century educational methods. Hence, there exists a significant and robust correlation between the attitudes and practices of 21st-century education, with a p-value of less than 0.01. Based on the Pearson correlation analysis, the Ho (5) null hypothesis indicates no significant link between attitude and 21st-century educational practice among recognized teachers, and this hypothesis was not rejected.

This study yielded results comparable to those of Rusdin *et al.* [36], who determined that multiple factors, such as teacher expertise and available resources, influence the implementation of 21st-century learning. Hence, it is imperative to strategically tackle this issue in order to attain optimal implementation of 21st-century education. Furthermore, there is a requirement to implement innovative, enjoyable, and purposeful pedagogical approaches, together with suitable educational resources encompassing school infrastructural amenities. Enhancing teachers' understanding of 21st-century education will enhance their utilization of PAK21 in their TLF. Therefore, this demonstrates the instructors' disposition towards implementing 21st-century education, which is generally positive despite not attaining the highest degree of proficiency. Hanapi *et al.* [33] argues that teachers should adopt a positive and inventive approach to using TLF methods that are more applicable to the implementation of PAK21. Teachers should adapt their approach by emphasizing individual traits, such as cultivating positive attitudes, enhancing abilities, and fostering critical thinking. These attributes will empower educators to enhance their teaching methods to apply PAK21 and sustain its practical implementation in the classroom.

Table 5. knowledge and attitude correlation test on 21st century education-related practices among teachers

Variables	Practices		
	Correlation value (*r*)	Significance	Correlation strength
Knowledge	0.677**	0.000	Moderate
Attitudes	0.837**	0.000	Strong

*Significant on the level $p<0.05$

4. CONCLUSION

Ultimately, the study determined that the instructors' degree of understanding regarding 21st-century education in chosen schools within the Rompin District of Pahang is moderate. Likewise, the degree of attitudes at a moderate level aligns with the implementation of education in the 21st century, indicating a moderate significance. On average, the degree of knowledge, attitudes, and practices of 21st-century education among instructors at selected schools in the Rompin district is moderate. However, examining gender disparities among instructors regarding their knowledge and attitudes toward 21st-century education reveals that these factors vary significantly between males and females. However, when it comes to implementing 21st-century education, there is no notable disparity between male and female teachers. Nevertheless, a moderate positive correlation was observed between the domain of knowledge and practice, although attitudes towards the utilization of 21st-century education exhibited a substantial positive correlation. Hence, this aspect of education will exert a substantial influence by facilitating the exposure of instructors to 21st-century education. Therefore, whether through formal courses or other methods, education in the 21st century is enhanced in every classroom, ultimately benefiting the students who will assume the role of the educator. Hence, this study is appropriate for various audiences, particularly scholars, in discerning educational literacy among instructors in the 21st century.

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