

A READINESS OF CHEMISTRY TRAINEE TEACHERS TOWARDS THE 2027 SCHOOL CURRICULUM

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Abstract

This study aims to identify the knowledge and readiness of Chemistry trainee teachers in Universiti Pendidikan Sultan Idris (UPSI), Malaysia, towards the 2027 School Curriculum. A survey design was used. The sample selection was conducted using simple random sampling, involving 150 UPSI Chemistry trainee teachers from Semesters 6, 7, and 8. The research instrument was a questionnaire using a five-point Likert scale. The questionnaire consisted of three sections, including demographic aspects, knowledge, and readiness of UPSI Chemistry trainee teachers towards the 2027 School Curriculum. The instrument was evaluated through expert agreement percentage for face validity (88.7%) and content validity (90%). The reliability of the instrument was measured through a pilot study conducted on 30 respondents, obtaining a Cronbach's alpha value of 0.976 for knowledge and 0.977 for readiness. The data were analysed descriptively using SPSS version 27 to obtain the mean and standard deviation (SD). The findings showed that the level of knowledge (mean = 3.93, SD = 0.899) and readiness (mean = 4.39, SD = 0.592) of UPSI Chemistry trainee teachers towards the 2027 School Curriculum were obtained. In conclusion, UPSI Chemistry trainee teachers' knowledge level was moderately high, while the readiness level was high. The study's implications underscore the need to reassess teacher training programs, with a focus on practical training and modern teaching strategies. Education lecturers should adopt student-centered approaches and provide continuous guidance. Additionally, trainee teachers should enhance their readiness through training, seminars, and workshops to ensure effective teaching aligned with the new curriculum.

Keywords: Knowledge, readiness, trainee teachers, 2027 School Curriculum

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Introduction

Teaching is a profession that requires a person to have high knowledge and be committed to imparting that knowledge to the community through effective and continuous efforts. Teachers play a significant role in achieving the National Philosophy of Education (FPK) and educational aspirations (Mohd Radzi & Muzammil, 2018). Therefore, a teacher must use appropriate strategies to impart knowledge to students based on the curriculum that has been set. The success and effectiveness of the implementation of a curriculum depend on the understanding and appreciation and implementation by teachers in the classroom (Haq, 2024). The relationship between teachers and curriculum has a huge impact on the learning experience of students in schools. Teachers must always understand the content, objectives, and curriculum structure in depth to ensure that the implementation of teaching and learning can be implemented effectively in the classroom.

The transformation of the educational curriculum in Malaysia has been implemented by the Curriculum Development Division. For example, through the implementation of the Secondary School Standard Curriculum (KSSM) in a ranked manner starting in 2017 to replace the Integrated Curriculum for Secondary Schools (KBSM), which was implemented from 1989 to 2016. In line with the current needs, the MOE has launched the School Curriculum 2027 (KP27) as an effort to revolutionize and improve

the education system in Malaysia. The new curriculum design will combine a standards-based curriculum and a competency-oriented curriculum that encourages active learning, providing a more authentic and meaningful learning and assessment experience.

The KP27 aims to produce prosperous people who practice a balanced life in all aspects, always cultivate lifelong learning, value racial unity and harmony, become civilized, responsible, and globally competitive citizens (Ministry of Education, 2023). This curriculum uses three new approaches, namely character building, emphasis on literacy and numeracy and integrated learning classes. The seven main thrusts introduced by Malaysia's Ministry of Education (MOE) in the framework of the KP27 involve self-development, communication, responsibility, digital fluency, diverse literacy, thinking skills and lifelong learning. All these thrusts consider all elements across the curriculum and the six pillars within the framework of the KSSM and the Primary School Standard Curriculum (KSSR).

The timeline for the implementation of the KP27 is also set as in Figure 1, which is that the dissemination of this curriculum will be carried out in 2025, then the implementation of the Preschool Curriculum in 2026 and in 2027, the implementation of the Preschool Curriculum 2027, Year 1 and Form 1 will be carried out.

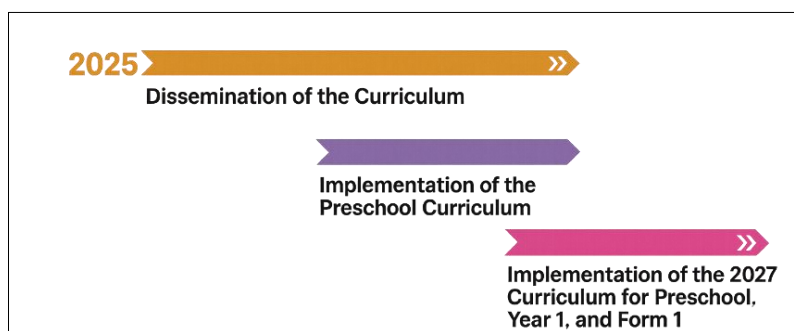


Figure 1. Timeline for the Implementation of the 2027 School Curriculum

Awareness and understanding of the KP27 is very important for the teachers who will implement the curriculum as well as for parents and the community, to ensure integrated support for students in achieving the desired educational objectives. This understanding allows all parties to understand the changes and adaptations needed as well as the long-term benefits that can be achieved through the implementation of this curriculum. To ensure the effective implementation of the KP27, the MOE has held educational roadshows throughout the country. This roadshow provides an opportunity for various parties including parents, teachers, and the public to provide views and feedback on the proposed new curriculum. The MOE also emphasized the importance of the involvement of all parties to ensure that the curriculum developed truly meets the needs of students and is in line with current challenges (Bernama, 2023).

Previous studies have highlighted the challenges encountered by teachers in adapting to educational policy reforms, including the implementation of new initiatives such as KP27. Mohd Nor Azmi and Mohd Hamzah (2023) reported that teachers' readiness to embrace change is influenced by access to technology, availability of professional development, and their attitudes toward innovation. However, insufficient resources and limited guidance remain significant barriers to effective implementation. Considering the challenges, training support and creative pedagogical needs that have been identified, this study was conducted to assess the level of knowledge and readiness of UPSI Chemistry trainee teachers for the KP27. Table 1 shows the objectives and research questions of this study. This study is not only an important foundation to ensure the success of educational transformation, but also plays a key role in supporting the Ministry of Education Malaysia's efforts to improve the quality of education in the country in line with current needs and global challenges. Through this study, it is hoped that the findings obtained can help in designing more effective interventions to support trainee teachers and existing teachers, so that the implementation of the KP27 can achieve its goal of empowering the

Malaysian education system.

Table 1. Objectives and research questions

Research Objective	Research Question
To identify the level of knowledge of UPSI Chemistry trainee teachers on the 2027 School Curriculum.	What is the level of knowledge of UPSI Chemistry trainee teachers towards the 2027 School Curriculum?
To identify the level of readiness of UPSI Chemistry trainee teachers for the 2027 School Curriculum.	What is the level of readiness of UPSI Chemistry trainee teachers for the 2027 School Curriculum?

Methods

Research design

This study was descriptive using the survey method. The design of this survey method is suitable for describing a phenomenon that occurs. According to Roni et al. (2020), quantitative research is an approach that involves collecting and analyzing numerical data to observe events that affect a particular sample population. This approach uses questionnaires, grouping, and then allowing for a more comprehensive and accurate understanding. This study used an online questionnaire built using Google Forms to collect demographic data, knowledge level, and readiness of UPSI Chemistry trainee teachers for the KP27.

Population and research sample

The population of this study consisted of 246 Bachelor of Chemistry Education students consisting semester 6, 7, and 8. From this information, the researchers selected students who attended the lectures of the Teacher Apprentices course (KPR3072) as a sample of the study. This selection was made because the KPR3072 course is one of the important components of education, which provides direct exposure to students on aspects of teaching and curriculum, including KP27. Students who have taken this course are more relevant for this study because they have been equipped with the knowledge and skills related to teaching, as well as preparation to face the challenges of the new curriculum. Therefore, selecting students who have taken this course ensures that the study sample consists of individuals with appropriate backgrounds to assess their knowledge and readiness towards the KP27. The number of trainee teachers enrolled by semester is shown in Table 2.

Table 2. Number of trainee teachers enrolled by semester

Semester of study	Number of UPSI Chemistry trainee teachers
6	93
7	37
8	116
Sum	246

The sample size of this study was determined based on Krejcie and Morgan (1970), who listed the sample sizes that corresponded to the size of the study population. The population in this study is 246 UPSI Chemistry trainee teachers, consisting of semesters 6, 7, and 8. The matching sample that was collected from the population was 150 people, as shown in Table 3.

Table 3. Sample size determination Krejcie and Morgan (1970)

N	S
230	144
240	148
250	152

N= total population, S= number of samples

Research Instruments

The five-point Likert scale questionnaire was used in this study to identify the knowledge and readiness of UPSI Chemistry trainee teachers towards the KP27. The items in this questionnaire were developed

by adapting the questionnaire from Romy et al. (2019). This questionnaire was divided into three parts, namely A, B, and C. Part A related to the demographics of the respondents, namely gender and semester. Part B identifies the level of knowledge, while Part C identifies the level of their readiness. Both Part B and Part C consist of a five-point Likert scale, which is (5) strongly agree, (4) agree, (3) less agree, (2) disagree, and (1) strongly disagree. The total number of items to test the level of knowledge and readiness of the trainee teachers is 28 items, as shown in Table 4.

Table 4. Questionnaire distribution

Category	No. Items	Number of Items
Demography	A1-A2	2
Knowledge	B1-B15	15
Readiness	C1-C15	13
Total Item Quantity		30

Validity and Reliability

The validity of the questionnaire instrument was checked by two experts in the field of education at Universiti Pendidikan Sultan Idris. Modifications to items are made based on expert feedback in terms of content, use of language, and appropriateness of terms. The assessment of the validity of the content was calculated using the percent consent formula proposed by Noah and Ahmad (2005). A four-point Likert scale is used to represent the level of expert agreement, and the results of the analysis show a consensus value of 90% (Table 5a). According to Noah and Ahmad (2005), the percentage value of consent above 70% is considered satisfactory and acceptable. Therefore, the questionnaire is considered valid and suitable for use in this study after the improvement process is carried out.

Next, pilot studies were carried out with the aim of testing the reliability of the instruments that have been developed and detecting their weaknesses. Through this pilot study, the researchers examined the functionality of the items from the aspects of reliability and item-respondent separation, polarity, and item suitability (Yunusa et al., 2014). The reliability of the instrument is determined by determining the value of Cronbach's alpha coefficient. A pilot study was conducted on 30 respondents. The obtained Cronbach alpha values are shown in Table 5b. Based on the interpretation table of Cronbach's alpha score (Bond & Fox, 2013), Cronbach's alpha coefficient in the range of 0.9-1.0 indicates excellent reliability and effectiveness with a high level of consistency.

Table 5. (a) The validity of the questionnaire and (b) Cronbach's alpha coefficient of the pilot study

(a)	Expert Appraisers	Approval (%)	(b)	Variable	Number of items	Cronbach's alpha coefficient
	Expert 1	97.3		Knowledge	15	0.976
	Expert 2	83.0		Readiness	13	0.977
	Overall	90.0				

Data Analysis

Data were analyzed descriptively using the Statistical Packages for the Social Sciences (SPSS) software version 27 to obtain mean values and standard deviations. Table 6 shows the interpretation of the mean score of the descriptive analysis by Neuman (2006) referred to interpret the mean score of the findings of this study.

Table 6. Interpretation of min score descriptive analysis

Mean score	Interpretation of mean score
1.00 – 2.00	Low
2.01 – 3.00	Medium low
3.01 – 4.00	Medium high
4.00 – 5.00	High

Result and Discussion

Level of Knowledge towards School Curriculum 2027

Overall, the level of knowledge of UPSI Chemistry trainees towards KP27 was at a moderately high level with an overall mean score of 3.93 and a standard deviation of 0.899 (Table 7). The findings show the majority of items earned a mean score between 3.5 and 4.0, signifying a satisfactory level of knowledge. The item that showed the highest knowledge was "The School Curriculum 2027 emphasizes a student-centered approach to teaching" (mean = 4.12, SD = 0.962), while the item with the lowest score was "I know three key aspects of the School Curriculum 2027 changes" (mean = 3.53, SD = 1.213). This shows that Chemistry trainee teachers at UPSI possess an adequate level of knowledge as the basis for their readiness to implement the KP27 in schools. This knowledge covers aspects of curriculum content, pedagogy, and new approaches, as well as an understanding of the structure and the seven main thrusts of KP27. All of these aspects are in line to produce students who are holistic, creative, and globally competitive.

Knowledge of the current curriculum plays an important role in ensuring the effectiveness of teaching and learning delivery. According to Aderinoye-Rabiu et al. (2025), mastery of content knowledge and solid pedagogy can increase the accuracy and effectiveness of knowledge delivery in the classroom. The moderately high level of knowledge gained in this study reflects the effectiveness of the existing training programmes at UPSI. However, the lowest mean score for knowledge-related items was against the main curriculum changes (mean = 3.53, SD = 1.213), indicating that there is still a need to strengthen understanding of the basic elements of curriculum change. A deep understanding of these changes is important to ensure that the implementation of KP27 is aligned with its original objectives. Additionally, the findings of this study support the findings of Bashir and Jimmy (2023), who assert that teacher trainees need to be equipped with a combination of technology, pedagogy, and content knowledge to adapt to the educational needs of the 21st century. In this context, knowledge of KP27's main core, which is a student-centered teaching approach, showed a high level of understanding with a mean score of 4.12 (SD = 0.962). This showed that the trainee teachers are ready to implement teaching strategies that emphasize a student-centered approach.

Although the findings show that the level of knowledge of trainee teachers is at a moderately high level, a critical assessment of their ability to apply that knowledge in a real context is still needed. Theoretical knowledge without practical skills can limit the effectiveness of curriculum implementation. Therefore, intensive practical training such as project-based assessment, self-learning, and lifelong learning needs to be emphasized to strengthen the ability of teacher trainees to apply the KP27 approach holistically and effectively.

Table 7. Mean and standard deviation of the level of knowledge towards KP27 (N=150)

No.	Item	Mean	SD
1.	I know in general about the 2027 School Curriculum.	3.67	1.174
2.	I know three main aspects of the 2027 School Curriculum changes.	3.53	1.213
3.	I know the three main goals of the School Curriculum 2027 in improving the quality of education.	3.61	1.163
4.	I know three important concepts in the 2027 School Curriculum.	3.56	1.293
5.	I know the elements of 21 st Century Learning (PAK21) in the 2027 School Curriculum.	3.89	1.124
6.	I know the 2027 School Curriculum emphasizes the importance of using technology in teaching.	4.11	1.027
7.	I know the 2027 School Curriculum emphasizes a student-centered approach to teaching.	4.12	.962
8.	I understand the need for project-based assessments in the 2027 School Curriculum.	4.07	1.063
9.	I learned about the role of communication skills in the 2027 School Curriculum.	4.08	.973
10.	I understand the concept of critical thinking emphasized in the 2027 School Curriculum.	4.07	.977
11.	I know about learning approaches that foster creativity in the 2027 School Curriculum.	4.11	.916

12. I am aware of the elements of collaborative learning suggested in the 2027 School Curriculum.	4.11	.970
13. I understand the importance of digital literacy in the 2027 School Curriculum.	4.07	.967
14. I know the preferred self-learning methods in the 2027 School Curriculum.	3.99	1.084
15. I know the lifelong learning approach in the 2027 School Curriculum.	3.95	1.038
Average Score	3.93	.899

Level of Readiness for the 2027 School Curriculum

The findings of the study showed that the level of readiness of UPSI Chemistry trainees towards KP27 was at a high level, with an average mean score of 4.39 and a standard deviation of 0.592 (Table 8). All items were at a high level, demonstrating their commitment and readiness to implement the KP27. The item with the highest score was "I am willing to guide students toward lifelong learning" (mean = 4.45, SD = 0.661), which reflects the trainee teacher's deep awareness of their role as facilitators in shaping competitive and critical-minded students. These findings are in line with KP27's goal of emphasising lifelong learning as the core of human capital development. On the other hand, the item with the lowest score of "I am ready to adopt teaching methods according to the 2027 School Curriculum" (mean = 4.29, SD = 0.805) showed that there was still room for improvement, especially in terms of practical adaptation to new teaching methods and strategies.

These findings support the view of Law (2022) and Gurion (2024), who assert that a high level of teachers' readiness is closely related to their ability to understand the objectives of the curriculum as well as increase confidence in its implementation. Willing teacher trainers tend to be more flexible in adapting pedagogical changes, integrating educational technology, and applying a student-centered learning approach that is in line with the principles of KP27.

Although the overall level of readiness was found to be high, the study revealed that there are certain aspects related to the practical teaching skills of teachers that recorded comparatively lower mean scores. This indicates the importance of giving more emphasis to the practical training of teachers. Emphasis should be placed on the application of theory in the actual context of the classroom, including classroom management, the use of project-based teaching approaches, and collaborative learning that can improve the effectiveness of curriculum implementation. Continuous professional training can strengthen trainee teachers' ability to adapt to curriculum transformations and enhance their pedagogical competencies. Such training programs have been shown to improve pre-service teachers' readiness, technological integration skills, and overall teaching effectiveness, thereby supporting the achievement of holistic and impactful educational goals (Nugraheni & Srisawasdi, 2025).

Table 8. Mean and standard deviation of the level of readiness towards KP27 (N=150)

No.	Item	Min	SD
1.	I am ready to adopt the teaching method according to the School Curriculum 2027.	4.29	.805
2.	I am willing to use technology in teaching in line with the Curriculum School in 2027.	4.37	.709
3.	I am willing to implement student-centered learning in my teaching.	4.39	.731
4.	I am ready to carry out the assessment project-based according to the 2027 School Curriculum.	4.37	.698
5.	I am confident in guiding students to develop their communication skills.	4.36	.792
6.	I am willing to cultivate critical thinking among students according to the 2027 School Curriculum.	4.35	.687
7.	I am willing to deliver learning that encourages students' creativity.	4.43	.688
8.	I am willing to implement collaborative learning in my classroom.	4.39	.662
9.	I believe that I can integrate literacy digital in my teaching activities.	4.39	.703
10.	I am ready to encourage students to engage in active learning.	4.48	.692
11.	I am willing to equip myself with teaching skills are in line with curriculum changes.	4.42	.726
12.	I am ready to accept the challenge in the implementation of the 2027 School Curriculum.	4.41	.697
13.	I am ready to guide students towards lifelong learning.	4.45	.661
Average Score		4.39	.592

This study showed that UPSI Chemistry trainers showed a high level of knowledge and readiness to implement KP27. A solid knowledge of the curriculum content, innovative teaching strategies, and an understanding of the structure of KP27 enable them to be prepared to implement this new curriculum effectively. This high level of readiness also reflects their ability to act as agents of change in realizing a vision of a 21st century education that is more inclusive, holistic, and globally competitive. However, strengthening the aspects of practical understanding and the application of basic elements of curriculum change should be emphasized through more intensive and continuous training. This step is important to ensure that the implementation of KP27 can be carried out optimally and achieve the national education goals that emphasize the balance between knowledge, skills, and values. Therefore, the support of training institutions and the provision of structured professional development programmes are needed to strengthen the effectiveness of the implementation of this curriculum among prospective educators.

Conclusion

In conclusion, the knowledge of UPSI Chemistry trainee teachers on KP27 was at a moderately high level, while their level of readiness is high. These findings show that trainee teachers already have an adequate knowledge base, yet there is still room to strengthen their understanding of key curriculum changes. Meanwhile, the high level of readiness reflects their confidence to implement the curriculum with new, more innovative approaches. This study is important for universities to strengthen practical training to ensure that trainee teachers can apply theory more effectively in the classroom. In addition, lecturers are advised to adapt the latest teaching approaches that are more relevant to the needs of the curriculum. Finally, trainee teachers are also encouraged to take advantage of available training opportunities and improve soft skills, such as communication and leadership skills, to meet the needs of the KP27 in a holistic and effective manner. This will ensure that they can play a crucial role in realizing the goals of a more inclusive and competitive 21st century education.

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Author Contribution

MI Saidin and SHA Sha'ari - designed the research question and applied the data generation instrument to undergraduate chemistry students. SHA Sha'ari - designed the electronic data collection instrument. MI Saidin and SHA Sha'ari - carried out the data analysis and contributed to the writing of this article.

Conflict of Interest

Authors declare no conflict of interest

Declaration on the Use of Generative AI

Authors use ChatGPT only for language enhancement during manuscript preparation.

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