# Antecedent Factors Influencing Teacher's Readiness in Teaching Design and Technology Education

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**Abstract:** Teacher readiness is necessary in the teaching and learning process, especially when a new curriculum is introduced. This study was conducted to identify the factors that influence the readiness of teachers in teaching Design and Technology (RBT) in the new Primary School Standard Curriculum (KSSR). The factors studied included self-efficacy, intrinsic motivation, ICT skills, and support training, which were the independent variables, and teacher readiness was the dependent variable. This descriptive quantitative survey involved 368 RBT teachers teaching Year 4 KSSR students in Peninsular Malaysia. Cluster and simple random sampling were used to select the sample of this study. The research instrument consisted of a set of questionnaires that contained 114 items adapted from previous research. A pilot study was conducted with a Cronbach's Alpha value of 0.95. Study data were analyzed using Statistical Package for the Social Sciences (SPSS) software. The results of the study show that the overall mean for teachers' readiness in teaching RBT is high. The findings showed that the overall mean for the aspect of reasoning knowledge was 3.82 (SP = .57) and SBA skills were 3.92 (SP = .58). Findings give the impression that the respondents have high reasoning knowledge and PBS skills. It was also found that the mean value for the aspect of SBA skills is higher than the reasoning knowledge. The regression analysis results show that all four factors significantly contribute to teacher readiness at 40.4 %. In conclusion, the findings of this study give the impression that the factors influencing teacher readiness are important in the formulation of a new curriculum. This study provides guidance to policy makers and curriculum planners especially for Ministry of Education Malaysia (KPM) on the aspect of teacher readiness when introducing new subjects.

**Keywords:** Teacher readiness, design and technology, primary school standard curriculum, multiple regression, TVET

## 1.  Introduction

In public policy, it is imperative that governments accord a heightened priority to investments in education vis-à-vis other societal necessities. This prioritization is rooted in the conviction that education serves as the crucible for cultivating prospective leaders who exhibit competence, global competitiveness, and resilience in confronting challenges (Wedell, 2022). In this regard, Wedell (2022) posits that change represents an unceasing process, wherein alterations to the educational curriculum, particularly curriculum reforms, accrue benefits to all stakeholders intertwined within the educational milieu.

Illustratively, Malaysia has undertaken a significant and well-organized overhaul of its educational curriculum, which serves as the standard across all educational institutions. This transformational initiative denominated the Malaysian Education Development Plan (PM) 2013–2025, was inaugurated in 2013. The plan meticulously delineates the objectives to be achieved over a 13-year period, encompassing dimensions of quality, equity, and accessibility. This endeavour heralded the onset of a comprehensive 15-year transformation endeavour aimed at revitalizing the national education system.

One pivotal facet of this transformation involves the introduction of the Primary School Standard Curriculum (KSSR) by the Ministry of Education and Culture as the inaugural step in supplanting the erstwhile curriculum, the Primary School Integrated Curriculum (KBSR) (Curriculum Development Department, 2011). The KSSR is conceived as a comprehensive and pertinent framework geared toward the cultivation of a well-rounded human capital capable of adeptly navigating contemporary and forthcoming challenges. This educational reform affords every student the requisite skills to leverage extant opportunities and surmount the exigencies of the 21st century.

Notably, the introduction of the subject of Design and Technology (RBT) coincided with the transition from KBSR to KSSR, effectively supplanting the prior subject of Kemahiran Sekolah Rendah (KHSR). This transition is characterized by a fundamental alteration in the approach to assessment, emphasizing facets of reasoning and evaluation employing the Problem-Based Assessment System (PBS). Additionally, the content of the RBT curriculum pivots toward the fostering of an appreciation for design, the application of technology, product fabrication, and product design evaluation (Curriculum Development Department, 2018), in stark contrast to the antecedent KHSR subjects. Facilitating effective pedagogy within the ambit of RBT necessitates the preparation and mastery of the Standard Curriculum and Assessment Document (DSKP) by educators, thereby augmenting the efficacy of teaching. As iterated by Ariffin and Yunus (2017), the readiness of teachers constitutes the foundational cornerstone underpinning a nation's educational accomplishments.

Within the context of Malaysian education, a recurrent theme involves an ever-evolving process of transformation and enhancement to ensure the elevation of educational standards and quality within the nation (Norliza, 2016). Considering this, the preparedness of educators to embrace educational system changes assumes paramount significance, as it emerges as a barometer of the efficacy of these reforms (Knoef, 2017). Empirical evidence underscores the critical nexus between teacher preparedness and educational attainment (Tumanduk, Kawet, Manoppo, & Maki, 2018), with a discernible positive impact on student performance (Lynch, Smith, Provost, Yeigh & Turner, 2017).

In addition to teacher preparedness, self-efficacy emerges as an instrumental determinant in the cultivation of effective pedagogical practices. Extensive scholarship has affirmed a constructive relationship between teacher self-efficacy and various teaching dimensions encompassing pedagogical practices, delivery methods, questioning techniques, and classroom management strategies (Tschnen-Moran & Woolfolk Hoy, 2001; Cantrell & Callaway, 2008; Tran, Duran, Richard & Burchinal, 2012; Kaygisiz, Aragun & Karaan, 2018; Ozdemir & Ozkan, 2018; Vidwans & Faez, 2019). Furthermore, the intrinsic motivation of educators emerges as an influential factor in engendering effective pedagogy, aligning with the assertions of Deci and Ryan (2000), who contend that intrinsic motivation catalyses the cognitive, social, and physical development of individuals, fostering a proclivity for knowledge acquisition, skill development, and attitudinal evolution.

To consummate the success of educational transformation, it is imperative that educators possess the requisite computer competencies to facilitate the delivery of information in an engaging and efficacious manner. The importance of information and communication technology (ICT) skills is underscored within the context of the Malaysian education landscape, as elucidated in the seventh shift of PM 2013-2025. This underscores the necessity for educators to equip themselves with ICT proficiencies to effectively navigate the terrain of 21st-century pedagogy, in alignment with the recommendations posited by Chai, Tan, Deng, and Koh (2017). As part of the contemporary modernization drive aimed at positioning Malaysia within the upper echelons of international assessments, it is incumbent upon educators to enhance their knowledge and competencies through training initiatives, consonant with the counsel of Mohd Izham and Mazlan (2018), thereby enhancing the efficacy of instructional delivery.

In summary, education in Malaysia is inexorably characterized by a perpetual process of metamorphosis and refinement. This evolutionary trajectory underscores the centrality of teacher preparedness and self-efficacy as pivotal determinants of educational success. Additionally, intrinsic motivation and ICT competencies emerge as essential elements in engendering effective pedagogy and realizing educational transformation objectives within the contemporary milieu. As Malaysia embarks on its journey towards educational excellence, the role of educators and their readiness for change emerges as a fulcrum upon which the nation's educational aspirations hinge.

## 1.1    Research Background

Teacher readiness is essential in the teaching and learning process, especially when the new curriculum is introduced (Stephanie, Laurah & Mohd. Zaki, 2021). This is because, at that point, the level of teacher readiness will drop to a low level. After all, teachers must face big changes that have not yet become a habit (Samsonova et al. 2020). The implementation of changes in RBT subjects demands a high level of teacher readiness to ensure that the learning content can be delivered well and effectively. What is worrying, previous studies conducted by (Rumahlatu et al. 2016; and Samsonova et al. 2020) show that teachers' readiness is at a low level when implementing changes in education. Studies by (Jamaliah, 2014; Nur Abidah, 2013; Siti Mardziah, 2013; Gopala, Roszainora, Nor Zaitolakma, Raja Nurul Huda,

Azyanee, Thenmolli & Haslina, 2014) regarding teacher readiness, it was reported that teachers are not fully prepared when something changes in education implemented. The same findings were obtained by Joza Fahd (2015) and Ekwueme and Meremikwu (2013) who conducted a study on the readiness of teachers in their respective countries.

The study of Unsal, Korkmaz and Percin (2016) has revealed that self-efficacy affects the level of teacher readiness. Based on previous studies, other factors affect teacher readiness, namely intrinsic motivation, ICT skills and support training (Alia, Mohamad Syafiq, Mohd Haniff, Dianna Suzieanna, & Mohd Faisal, 2020; Sarfo et al., 2017; Hao & Lee, 2015; Cetin, 2016).

The research gap about teacher readiness is still significant even though there have been studies conducted before. For example, a local study on teacher readiness that focuses on aspects of teacher knowledge in reasoning and teacher assessment skills using school-based assessment (SBA), especially in fourth-year RBT, is still under-conducted. Studies that present empirical data on the relationship between self-efficacy, intrinsic motivation, ICT skills and appropriate and effective support training with teachers' readiness to implement RBT in Peninsular Malaysia are still limited. Therefore, there is a need for this study to be conducted to examine the level of teacher readiness from the aspect of knowledge and skills as well as the factors affecting readiness in implementing RBT teaching in the fourth year of KSSR.

The objectives of the current study are as follows: 1) To identify the level of teachers' readiness from the aspect of knowledge and skills in the implementation of RBT to teach Year 4 KSSR students, 2) To determine the factors that contribute to the level of teacher's readiness in teaching RBT for Year 4 KSSR students. The results of the current study are important to help teachers identify their level of readiness in teaching RBT KSSR, especially reasoning knowledge and assessment skills. In addition, the findings assist teachers in identifying aspects that require priority and special attention because they indirectly help teachers make appropriate preparations before teaching a new subject.

## 1.2    Teacher Readiness on Design and Technology Course Implementation

The attempt to implement RBT KSSR teaching will not be successful if teachers are unprepared or underprepared yet are pressured to do so (Van Tassel-Baska et al., 2005). Teacher readiness is defined as the teacher's ability and skills to carry out teaching in the classroom (Inan & Lowther, 2010). Teacher readiness in this study is defined as a teacher's ability, knowledge, and skills to implement RBT in teaching Year 4 KSSR students. Wallace's Reflective Model (1991) is used as a guide on teacher readiness. Wallace (1991) adheres to the belief that before following professional training, a teacher usually has existing knowledge and experience related to his field of work. When following professional training, a teacher will associate the knowledge he received (received knowledge) with knowledge through experience (experiential knowledge) which are two important sources of knowledge in professional training. The two sources of knowledge according to Wallace are interdependent to enable teachers to be better prepared to carry out their professional duties.

Research on teachers' readiness has been done in several disciplines of education (Sarah Alia & Nor Hafizah, 2021; Vhyshnavi & Khairul Azhar, 2021; Nurul Farahah, Nor Atiqah & Suziyani, 2020: Jaggil & Muhammad Suhaimi, 2018; Norhisham, Norazilawati & Noraini, 2018). Based on the RBT KSSR teaching and learning process, it is discovered that there is a dearth of research on teachers. A study on teacher readiness involving KSSR was also conducted by Norazilawati, Noraini, Mahizer, Nik Azmah & Rumaizah (2014). The findings of the study show that the level of teacher readiness in terms of knowledge and skills is at a moderate level. Zarina (2016) also conducted a study on teacher readiness involving 138 teachers in Batu Pahat, Johor. The results of her study show that teacher readiness is high and there is a significant difference between teachers who have more than 20 years of teaching experience with knowledge of applying high order thinking in the teaching and learning process. Previous studies are still inconsistent, only focusing on readiness for knowledge and skills in general. This research focuses more on readiness from the aspect of reasoning knowledge and school-based experience.

In terms of teacher self-efficacy, Tschannen-Moran et al, (2001) defined it as the teacher's belief in his ability to organise and perform a series of actions required to complete a teaching task in a specific context. In the context of this study, teacher self-efficacy refers to teachers' belief in their ability to organise teaching and learning RBT among Year 4 KSSR students. It was measured through three dimensions: teaching strategies, classroom management, and student involvement. Self-efficacy refers to the Social Cognitive theory by Bandura (1986, 1997) which states that human achievement depends on the continuous interaction between a person's behaviour, individual personal factors, and environmental conditions. Nurul Shahhida, Siti Mistima and Roslinda (2020) conducted a teacher self-efficacy study on 66 teachers in Port Dickson, Negeri Sembilan. Their findings indicate that there is no significant difference between male and female teachers in terms of their self-efficacy in integrating technology. A study on the level of self-efficacy of teachers was also conducted by Awanis, Ainunmadiah and Siti Noor (2016) in a secondary school in Kelantan. The findings of the study show that the level of teacher efficiency is high. A high level of self-efficacy reflects that teachers have high confidence in their ability to deliver lessons.

Nevertheless, intrinsic motivation factors make a great contribution to influencing teacher work performance (Lai & Han, 2020). Several factors, including intrinsic motivation, contribute to teachers' lack of readiness for the changes brought about by smart education (Nirwana, 2013). Intrinsic motivation is defined as an internal drive and tendency to explore the internal and external world of the individual himself (Deci & Ryan, 2000). Deci and Ryan are the individuals who introduced the Self-Determination Theory in 1985. This Self-Determination Theory explains individual motivation. Intrinsic motivation is taking behaviours to experience pleasure and satisfaction, such as the joy of doing a certain activity

or fulfilling curiosity (Dornyei, 2001). In the context of this study, the teacher's intrinsic motivation refers to the teacher's internal drive to manage the teaching and learning of RBT for Year 4 KSSR students. Previous studies show that intrinsic motivation is one of the important aspects that affect teacher readiness. This is proven by Alia et al., (2020) in her study on the level of motivation and intrinsic factors that influence Islamic Education teachers. The results of the study show that teachers' intrinsic motivation is at a high level. There is a positive relationship between intrinsic motivation and the motivation factors studied.

Teachers also show a positive attitude towards ICT. Information and communication technology (ICT) skills refer to all elements of technology, such as retrieving, storing, processing, publishing, and presenting information used in the teaching process in the classroom (Bebell, Russell, & O'Dwyer, 2004; Isiyaku, Mohd Ayub, & Abdul Kadir, 2018). ICT skills are also known as computer literacy (Copriady, 2015; Hasnah, Su Luan, Mohd Ayub & Mahmud, 2009), which includes knowledge about the basic concepts and operations of ICT. ICT skills in the context of the study refer to teachers' perceptions of their ability to use ICT in the teaching and learning of RBT during the process of teaching Year 4 KSSR students. ICT skills are measured by covering three dimensions, namely basic ICT skills, online application skills, and computer-aided teaching and learning skills. ICT skills are new, and teachers can build their own ideas to create a fun teaching atmosphere, then Constructivism Theory is appropriate to use. According to the theory of constructivism, knowledge is built through a process of interrelationship between old learning and new learning. A technology-related study was also conducted by Hao and Lee (2015) involving 350 pre-service teachers in Taiwan. The results of the study show that pre-service teachers are at the level of information, personal and cooperation in the use of Web 2.0 technology. The study by Abu-Obaideh et al. (2012) reveals that teachers' ICT proficiency is at a moderate level. The study's findings also indicate that there is a considerable disparity in ICT preparedness between male and female teachers in terms of knowledge, skills, and attitudes.

Also, support training can change the way and improve teachers' teaching and learning (Gall & Acheson 2011; Murray 2010). Support training is defined as the process of improving the skills and competence of staff to produce excellent results (Hassel, 1999). In the context of this study, support training refers to the exposure received by teachers related to RBT KSSR, including through a series of courses, seminars, and workshops to increase knowledge and skills to implement RBT KSSR. Thorndike's 1911 Stimulus-Response Behaviourism Theory has introduced the concept of readiness through three laws and one of them is the Law of Training. This theory becomes the basis of reference in teacher support training. The Law of Training states that the more a particular exercise is carried out, the stronger the bond or association of a particular response with the associated stimulus.

According to prior research, teachers participating in staff development and support training programmes have better teacher instruction (Cetin, 2016). The results of earlier studies support the notion that staff development programmes and training sessions impact teachers' readiness to teach. The findings of Mohd Izham and Mazlan's (2018) study on teacher support training in High-Performance Schools in the Federal Territory of Putrajaya show that there is a significant difference in teaching experience and the frequency of attending training. The frequency with which teachers attend training will provide opportunities for the proliferation of knowledge and skills in line with the demands of professional development which requires lifelong learning through continuous training (Rossilah, 2008).

## 2.     Research Methodology

## 2.1     Research Design

This study used a quantitative descriptive survey design. Survey research, particularly those including attitudes, beliefs, actions, and perceptions, can describe topics and problems from various perspectives (Creswell, 2018). The purpose of the study was to examine teacher readiness in teaching RBT and to examine the relationship between the independent variables and dependent variables as well as to determine the factors influencing teachers' readiness in teaching RBT.

## 2.2     Research Sample

The population of this study comprised 7089 RBT teachers from Peninsular Malaysia who taught Year 4 primary school students (Education Policy Planning and Research Division Ministry of Education Malaysia, 2016). Cluster sampling and simple random sampling were used to select the sample. The cluster sampling carried out involves three phases. In the first phase, primary schools found in Peninsular Malaysia are clustered according to zones, namely the northern zone, eastern zone, central zone, and southern zone. The second phase determines the type of school based on the zone which is the National School (SK), the Chinese National School (SJKC), the Tamil National School (SJKT), the Native National School (SK Asli), the Cluster Primary School (SRK) and the Government Aided Religious School (SABK).

The third phase involves the number of samples of each type of school. To determine the selection of the sample, a simple random procedure using the fishbowl technique is used. All schools that are in the same school-type group will be mixed and a draw will be made. For example, all the National Schools are mixed and drawn randomly based on the number of samples required. The total sample selected based on Cochran's formula (1977) was 364. To account for the potential of incomplete or non-returned instruments, 450 sets of surveys were mailed to respondents.

## 2.3    Research Instruments

This research instrument contained six (6) parts adapted from previous questionnaires. Part A contained 11 items to obtain demographic information. Part B contained 21 5-point Likert scale items adapted from Adediwura's (2012) questionnaire. Part C contained 24 9-point Likert scale items adapted from the Teachers' Sense of Efficacy Scale questionnaire developed by Tschannen-Moran and Woolfolk (2001). Next, Part D consisted of 21 7-point Likert scale items adapted from the Intrinsic Motivation Inventory (IMI) questionnaire developed by Deci and Ryan (1985). Part E consisted of 22 4-point Likert scale items developed by Isiaka (2014), and the last part, Part F, contained 15 4-point Likert scale items adapted from Bayar's (2014) questionnaire.

## 2.4    Validity and Reliability

Before the pilot study was carried out, the questionnaire was distributed to seven (7) subject-matter experts to ensure its content validity. All recommendations, enhancements, and consensus provided by the experts regarding the suitability of the content and scale utilised in measuring the instrument were considered. Face validity was also done simultaneously with content validity by four appointed experts. Recommendations and suggestions for improvement from appointed experts are considered to further strengthen the research instrument.  Also, the Creswell (2018) recommended coefficient was used to assess the instrument's dependability. The whole instrument's Cronbach's Alpha value was 0.95.

## 2.5    Data Analysis

Research data were analysed using descriptive statistics and inferential statistics. Descriptive statistical analysis was used to identify the level of readiness, self-efficacy, intrinsic motivation, ICT skills and support training.   On the other hand, the contribution of the independent variable was ascertained using inferential statistics, namely Multiple Regression analysis with the Enter technique. Self-efficacy, intrinsic motivation, ICT skills, and support training were the independent variables of the study. Statistical Package for Social Science (SPSS) was used to analyse the research data.

## 3.    Research Findings

## 3.1    Profile of the Respondent

According to Table 1, there were 191 (51.9 %) female teachers, followed by 177 (48.1 %) male teachers. A total of 173 (47.0 %) respondents, or the majority, were between the ages of 30 and 39. The second-largest group consisted of a total of 140 (38 %) respondents who were over 49 years old. The remaining 55 (15 %) of the responders were under the age of 39. The bulk of respondents, 334 (90.8 %), had less than five years of RBT teaching experience, and 230 (62.5 %) had less than five years of Kemahiran Hidup Sekolah Rendah (KHSR) teaching experience, according to research on respondents' teaching experience. In addition, 202 respondents (or 54.9 %) had teaching experience ranging from five to ten years. This information indicates that in addition to RBT and KHSR, the respondents also taught other subjects.

**Table 1 - Profile of the respondents**

|  | Group | Frequency | Percent (%) |
|---|---|---|---|
| Gender | Male | 177 | 48.1 |
|  | Female | 191 | 51.9 |
|  | Total | 368 | 100 |
| Age | Below 29 years | 55 | 15.0 |
|  | 30 - 39 years | 173 | 47.0 |
|  | 40 - 49 years | 94 | 25.5 |
|  | 50 years and above | 46 | 12.5 |
|  | Total | 368 | 100 |
| Experience teaching RBT | < 5 years | 334 | 90.8 |
|  | 5 – 10 years | 27 | 7.3 |
|  | > 10 years | 7 | 1.9 |
|  | Total | 368 | 100 |
| Experience teaching KHSR | < 5 years | 230 | 62.5 |
|  | 5 – 10 years | 79 | 21.5 |
|  | > 10 years | 59 | 16.0 |
|  | Total | 368 | 100 |
| Overall teaching experience | < 5 years | 76 | 20.6 |
|  | 5 – 10 years | 202 | 54.9 |
|  | > 10 years | 90 | 24.5 |
|  | Total | 368 | 100 |

## 3.2 Teachers' Readiness in Implementing the Teaching of RBT Year Four KSSR

Table 2 presents the descriptive analysis of the current study. The total mean for the reasoning knowledge item was 3.82 (SP = .57). This suggests that the respondents had a strong understanding of reasoning and were prepared to introduce RBT instruction to Year 4 KSSR students. The findings indicate that respondents understood the objectives of the RBT subject (M = 4.15, SP = .49) because the item received the highest mean value. Next, respondents were knowledgeable about the subjects covered in RBT courses (M = 3.88, SP = .60) and that they could mentor students in RBT classes to help students develop their critical thinking abilities (M = 3.84, SP = .59). The respondents' knowledge of the types of reasoning skills to utilise when teaching RBT received the lowest mean (M = 3.68, SP = .62). This result indicates that, in comparison to other areas of reasoning knowledge, the respondents' readiness in terms of knowledge about the types of reasoning skills to use when teaching RBT was still subpar.

**Table 2 - Teachers' readiness in terms of reasoning knowledge**

| | Item | Mean | Standard Deviation |
|---|---|---|---|
| B1 | I clearly understand the objectives of RBT subjects | 4.15 | .49 |
| B2 | I have mastered the topics in the RBT subject | 3.88 | .60 |
| B3 | I clearly understand the meaning of reasoning as an additional element when teaching RBT | 3.80 | .56 |
| B4 | I am knowledgeable of the basic reasoning skills to use when teaching RBT | 3.80 | .56 |
| B5 | I am knowledgeable in the types of reasoning skills to use when teaching RBT | 3.68 | .62 |
| B6 | I am knowledgeable in using reasoning skills in problem solving when teaching RBT | 3.74 | .60 |
| B7 | I am knowledgeable in using reasoning skills in decision-making while teaching RBT | 3.76 | .56 |
| B8 | I am knowledgeable in using teaching techniques that promote students' reasoning skills when teaching RBT | 3.76 | .57 |
| B9 | I am knowledgeable in planning teaching activities that involve reasoning skills when teaching RBT | 3.82 | .56 |
| B10 | I can guide students to have reasoning skills when teaching RBT | 3.84 | .59 |
| | Overall mean | 3.82 | .57 |

The average value for various school-based assessment skills (SBA) is shown in Table 3. The overall mean value of the SBA skill aspect was 3.92 (SP = .58). This result indicates that the respondents' SBA proficiency was moderately high. The item with the highest mean value was on the respondents' proficiency to provide guidance to pupils to complete activities (M = 4.06, SP = .51). Next, it was discovered that responders had the ability to clarify assignment requirements (M = 4.01, SP = .55) and supervise students' completion of course work (M = 4.01, SP =. 56). However, the results indicate that the respondents still lacked proficiency in each component of RBT course work (M = 3.74, SP = .60).

The study's results also demonstrate that teachers were more prepared in terms of PBS abilities than in terms of knowledge of thinking. This demonstrates that respondents are better prepared than they are in terms of reasoning knowledge for applying RBT instruction to Year 4 KSSR students.

**Table 3 - Teachers' readiness in terms of SBA skills**

| | Item | Mean | Standard Deviation |
|---|---|---|---|
| B11 | I am proficient in the interpretation of proficiency level (TP) of RBT subjects | 3.91 | .57 |
| B12 | I am proficient in every element that should be present in RBT course work | 3.74 | .60 |
| B13 | I am skilled in assessing students' coursework according to the level of mastery (TP) set in the subject RBT | 3.88 | .60 |
| B14 | I am skilled in explaining the criteria of RBT coursework assignments before they are given to students | 4.01 | .55 |
| B15 | I am skilled in monitoring students to perform RBT coursework according to the set criteria | 4.01 | .56 |
| B16 | I am skilled in instructing students on RBT course work assignments according to correct procedures | 4.06 | .51 |
| B17 | I am skilled in guiding students to obtain the highest level of mastering (TP) in RBT coursework | 3.86 | .63 |
| B18 | I am skilled at determining the highest level of mastering that a student can achieve in RBT coursework | 3.82 | .62 |
| B19 | I am skilled at assessing each student as they go through the process of RBT coursework | 3.96 | .59 |
| B20 | I am skilled in assessing aspects that need to be assessed in RBT coursework | 3.94 | .59 |
| B21 | I am skilled at evaluating all students' RBT coursework | 3.96 | .59 |
| | Overall Mean | 3.92 | .58 |

## 3.3 Factors that Contribute to Teachers' Readiness in Teaching RBT Year 4 KSSR

The factors (self-efficacy, intrinsic motivation, ICT skills, and support training) that influence teachers' willingness to undertake RBT teaching when teaching Year 4 KSSR were predicted using multiple regression analysis. The residuals' normality, linearity, homoscedasticity, and independence were taken into consideration. Table 4 displays the summary of the regression model. The factors under investigation can vary teacher readiness by up to 40.4% (R square) when implementing RBT teaching to Year 4 KSSR students.

**Table 4 - Summary of the Regression Model**

| R | R Square | Adjusted R Square | Std. Error of Estimate |
|---|---|---|---|
| .636[a] | .404 | .398 | .31426 |

Dependent variable: Willingness.

Constants: Self-efficacy, intrinsic motivation, ICT skills, and support training.

The results of ANOVA regression analysis (refer to Table 5) show a significant linear relationship between the independent variable and the dependent variable ($F_{(4,367)} = 61.638$, $p = 0.000$).

**Table 5 - ANOVA regression analysis**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 24.349 | 4 | 6.087 | 61.638 | .000 |
| Residual | 35.849 | 363 | .099 | | |
| Total | 60.198 | 367 | | | |

The estimation model for the coefficients (refer to Table 6) shows that the predictor variable that affected teacher readiness was self-efficacy with the highest Beta value ($\beta$) of .266, followed by intrinsic motivation ($\beta$ = .243), support training ($\beta$ = .232), and ICT skills ($\beta$ = .171). The regression analysis equation used was as follows:

$$= .139x_1 + .104x_2 + .110x_3 + .226x_4 + 1.339 \qquad (1)$$

Based on these values, it is concluded that self-efficacy is the most important factor in influencing teachers' willingness to implement RBT teaching to Year 4 KSSR students.

**Table 6 - Estimation model for coefficients**

| | Unstandardised Coefficient | | Standardised Coefficient | | |
| --- | --- | --- | --- | --- | --- |
| | B | Std. Error | Beta | t | Sig. |
| Constant | 1.339 | .171 | | 7.840 | .000 |
| Self-efficacy | .139 | .024 | .266 | 5.766 | .000 |
| Intrinsic motivation | .104 | .020 | .243 | 5.106 | .000 |
| TMK skills | .110 | .027 | .171 | 4.050 | .000 |
| Support training | .226 | .044 | .232 | 5.080 | .000 |

## 4.      Discussion

The study's results reveal that the mean score for teacher readiness, specifically concerning reasoning knowledge and PBS skills in the implementation of RBT teaching, is at a notably high level. This finding is congruent with the outcomes of Zarina's study in 2016, which similarly reported that teachers demonstrated a high level of readiness with respect to knowledge for teaching and learning. In contrast, a departure from these results was noted in Norazilawati et al.'s investigation in 2014, which indicated a moderate level of readiness in terms of both knowledge and skills. Although disparities exist between this study and previous research, the overarching conclusion underscores the high level of readiness exhibited by fourth year RBT teachers in relation to knowledge and skills essential for implementing fourth year KSSR RBT teaching. This suggests that these teachers have received substantial exposure to RBT subjects, positively impacting their readiness to facilitate RBT teaching and learning in the fourth year of KSSR. Consequently, these findings unequivocally demonstrate that the high level of readiness among teachers can facilitate the effective implementation of RBT teaching in the fourth year of KSSR, despite the recent introduction of this subject.

Furthermore, the preeminent contributor to the variance in teacher readiness for implementing RBT teaching in the fourth year of KSSR is self-efficacy. These observations align with the findings of Masturah and Khalip's study in 2018, which identified teacher self-efficacy as the foremost factor influencing teacher readiness. Consequently, each incremental unit of enhancement in teachers' self-efficacy with regard to implementing RBT teaching in the fourth year of KSSR corresponds to a commensurate increase in their willingness to engage in such instruction. The second most influential factor shaping the readiness of fourth year RBT teachers in KSSR is intrinsic motivation. These findings concur with those of Gangwani's research in 2012, which similarly underscored the contributory role of intrinsic motivation in enhancing teachers' readiness to implement RBT teaching in the fourth year of KSSR.

Furthermore, support training emerges as another significant factor contributing to teachers' readiness for the implementation of RBT teaching in the fourth year of KSSR. This conclusion is congruent with the outcomes of studies by Mohan, Lingam, and Chand in 2017, which explored the factors influencing professional development. It becomes evident that supportive training is crucial for sustaining changes in teaching practices, irrespective of whether teachers are newcomers or seasoned professionals.

Lastly, a factor that also contributes to teachers' readiness in implementing RBT teaching in the fourth year of KSSR is ICT skills. However, it is noteworthy that ICT skills represent the least significant contributing factor when compared to other factors, namely self-efficacy, intrinsic motivation, and support training. This finding diverges from the conclusions of Kiru's study in 2018, which examined the role of ICT and identified ICT skills as a primary contributor, alongside teacher collaboration, mathematical effectiveness, and teacher professional development.

In summary, all the factors investigated exert meaningful influences on teachers' readiness for implementing RBT teaching in the fourth year of KSSR. Therefore, it is imperative to consider the interplay of self-efficacy, intrinsic motivation, ICT skills, and support training when implementing curriculum changes to ensure that teachers are adequately prepared for the effective execution of RBT teaching in the fourth year of KSSR. This research significantly contributes to the body of knowledge by systematically exploring and corroborating the constructs that underpin the factors influencing teachers' readiness in the implementation of RBT in the fourth year of KSSR. Furthermore, these findings have the potential to fortify Wallace's Reflective Model (1991), which serves as the foundational reference for this study. Both sources of knowledge—those acquired through training and experiential knowledge—are deemed interdependent, facilitating the better preparation of teachers for their professional responsibilities.

## 5.    Conclusion

This study sheds light on the readiness of RBT teachers to implement instruction for Year 4 KSSR students. The findings underscore a generally positive perception of readiness among these teachers, indicating a strong foundation for RBT education. However, it is evident that there is room for enhancement in certain aspects to ensure more effective delivery. The study highlights four key factors, namely self-efficacy, intrinsic motivation, ICT skills, and support training, as influential contributors to teachers' readiness to undertake RBT instruction for Year 4 students. Among these, self-efficacy and intrinsic motivation emerge as the primary drivers, exerting the most significant impact on teacher readiness. This underscores the importance of nurturing these attributes among RBT educators to enhance their effectiveness in delivering instruction to Year 4 KSSR students. Overall, it is crucial to acknowledge that teacher readiness to implement RBT teaching is a multifaceted construct influenced by a combination of factors. As such, comprehensive efforts must be made to consider and foster all these factors in the TVET teacher training curriculum for RBT. By incorporating elements that bolster self-efficacy, intrinsic motivation, ICT skills, and support training, the curriculum can better prepare RBT teachers to excel in their roles, especially when instructing Year 4 KSSR students. This research provides valuable insights and directions for the refinement and optimization of RBT teacher training programs, ultimately enhancing the quality of education and the learning experiences of students in Year 4 KSSR.

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