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Teachers’ Readiness in Implementing 21st Century Learning

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Abstract
This study aims to identify teachers’ readiness in implementing 21st century learning. Teachers play the main role in determining the outcomes of 21st century learning. Teachers’ perception and understanding towards an innovation in education influence their action, decision and practice in classroom. Teachers are the main factor that contributes to pupils’ performance in mastering 21st century skills which consist of 4C’s: i) creativity, ii) communication, iii) collaboration and v) critical thinking skills. This survey was conducted by using questionnaire as research instrument. A total of 107 teachers involved in this survey. The sample was chosen randomly. The data were analysed by using descriptive analysis consist of mean and standard deviation, Pearson Correlation test and one-way analysis of variance (ANOVA). The findings show that teachers’ readiness in implementing 21st century learning is high, there is significant correlation between academic level and the level of understanding 21st century learning skills and there is significant difference between certificate holder and master’s degree holder in understanding 21st century learning skills. The implication of the study is that teachers are ready to implement 21st century learning in classroom and an action has to be taken to promote teachers to further their study at the higher level and improve their understanding, knowledge and skills in teaching.

Keywords: Teacher Readiness, 21st Century Skills, 21st Century Learning, Academic Level, Understanding.

Introduction
The need in educating pupils to produce high quality generation with the capability to deal with 21st century globalization has become a very important agenda nowadays. Kementerian Pendidikan Malaysia (KPM) has introduced Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 and 21st century learning and facilitating idea.

Curriculum reformation encompassed all aspects of skills and competencies that can fulfill the needs of 21st century education where Kurikulum Standard Sekolah Rendah (KSSR) and Kurikulum
Standard Sekolah Menengah (KSSM) were implemented since 2011. Both standardized curriculums were improved with the implementation of KSSR (review) and KSSM (review) start from 2017. KPM encourage teachers to take inisiative in self-development, increasing knowledge and skills and apply new practices of teaching and learning to deal with the needs of 21st century as cited in PPPM 2013 - 2025.

21st century learning focuses on four skills (4Cs) that should be mastered by pupils, namely communication, critical thinking, collaboration and creativity as cited in Buletin Anjakan Buletin Transformasi Pendidikan Malaysia bil 4/2015. The responsibility of fostering the 4Cs 21st century learning skills is very important in vision to achieve PPPM 2013 - 2025 and all the teachers play the main role in carry out the responsibility. Knowledge should be delivered integratedly with pupils learning activities (Azmi & Nurzatulshima, 2017). Teachers need to use variety of techniques such as brainstorming, role-play, games and other pupil-centered learning activities that appropriate with contents and skills as planned to be achieved during the learning session. At this point, creativity skill becomes an important element that empowers teachers’ capability to use as many as generating idea technique, develop and communicate new ideas in effective ways.

Teachers should possess six expertises as 21st century educator as mentioned in Buletin Anjakan Buletin Transformasi Pendidikan Malaysia bil 5/2015. The six expertises are: i) mastering knowledge/subject/content; ii) mastering 21st century pedagogy; iii) mastering the skill in tracing pupil’s development and achievement and provide support; iv) mastering learning psychology skill, v) possess counseling skill; and vi) competent in using information technology and media.

Teachers play the main role in integrating technology in classroom routine (Langworthy, 2013; Amran & Rosli, 2017). Integrating information technology and media and make it relevant with pedagogy and teaching techniques play important parts in assisting and support 21st century learning progress among pupils (Rahim & Abdullah, 2017). Integration of technology offers opportunities for pupils to master 21st century skills like information skills, collaboration and self-access learning (Walser, 2008; Amran & Rosli, 2017).

According to Buletin Anjakan Buletin Transformasi Pendidikan Malaysia 5/2015, the process of planning and implementing 21st century learning should base on four main principles: i) pupil-centered learning; ii) collaborative learning; iii) contextual learning; and iv) integrating with community. Teachers’ perceptions toward 21st century pedagogy practice should be nourished with creativity thinking, innovative thinking, critical thinking, emphasise on problem solving and ability in decision making (Osman & Basar, 2016).

The way teachers implement teaching process affecting the outcomes of 21st learning (Langworthy, 2013; Amran & Rosli, 2017). Acknowledge the content and learning standard, pupils’ previous knowledge, preparing resource and select appropriate strategy which is match to the skill that will be taught should be emphasized by teacher (Ariffin & Yunus, 2017; Rajendran, 2001). Teachers are supposed to have high capability in planning and implementing teaching and learning that fulfill the needs of immersing 21st century learning skills through effective,
Interesting and interactive pedagogy practice (Ariffin & Yunus, 2017). Furthermore, learning should be carried out in meaningful ways through ‘learning by doing’ approach where pupils are stimulated to think and build understanding meaningfully (Ariffin & Yunus, 2017).

Pedagogy is the fundamental of quality teaching and learning carried out by teacher and encompassing principles, techniques and processes of teaching (Ariffin & Yunus, 2017). Systematic, interesting and appropriate teaching and learning process can lead pupils to get involve actively and maintain pupils’ motivation during the learning process (Salehudin, Hasan & Hamid, 2015).

**Problem Statement**
According to NCREL: enGauge 21st century skills (2003), 21st century skills can prepare new generations to deal with any possibility that may occur in industrial citizen, global economy, technology with rapid change, excessive information and application of computer as needs in daily life.

In attempts to instill each pupil with 21st century skills, teachers face a great challenge since there are many 21st century skills to be instilled in limited teaching times (Yunos, 2015). The attempts to instill 21st century among pupils are quite difficult as the pupils have different previous knowledge, passionate, motivation and learning style. It is teachers’ responsibility to take initiatives in maintaining pupils passionate and motivation by applying various meaningful techniques and approaches in teaching and learning (Iberahim, Mahamod & Mohamad, 2017). Effective teaching approaches play important part in increasing pupils’ ability to master knowledge and skills they required. However, Teachers are reported to face the compact curriculum and central exam issues (Rajendran, 2001) where teachers must cover the syllabus and prepare pupils for examination (Rajendran, 2001; Saad, Saad & Dollah, 2012).

New direction of teaching with creative planning might improve pupils’ comprehension (Salehudin, Hassan & Hamid, 2015). Teaching should change their teaching practice form traditional method oriented to pupil-centered creative teaching that focus on thinking skills and ICT-based self-learning (Salehudin, Hassan & Hamid, 2015). However, A research carried out by Puteh, Ghazali, Tamyis and Ali (2012) has recognized the weaknesses of teaching was caused by low teachers’ expertise in teaching strategy and understanding the visions of new curriculum reformation.

The finding of a research carried out by Salehudin, Hassan and Hamid (2015) proved that teaching strategy and approach play important part in drawing pupils’ interest towards a subject and change their perception about the subject regarding to the subject difficulties. Yunos (2015) has reported the limited strategy, technique, method and approach used by the teacher has lead to lack of pupils’ interest in learning process. The failure of teacher in instilling 21st century skills caused pupils to be unable to integrate 21st century skills in their learning process (Mahamod, 2011).
Teachers are still under the paradigm of implementing traditional teaching and learning with teacher-oriented strategy (Rajendran, 2001). Most of the teachers apply conventional teaching method till now (Azmi & Nurzatulshima, 2017). The process of delivering content has implemented by teacher in passive ways. As the consequence, pupils’ involvement in learning activity has been retarded and learning process become quite limited.

The best teaching and pedagogy practice should apply various methods, strategies, techniques, approaches and resources and well blended to make sure teacher-centered, pupil-centered and resource-centered are combined in harmony and help pupils stay focus during teaching and learning session (Yunos, 2015). The findings in a study indicate that teachers must be knowledgeable about the field of pedagogy, the subject matter and the learning needs of the students. Furthermore, teachers must not only be knowledgeable about the content of the lesson but also the content of previous lessons (Veloo, Krishnasamy & Ali, 2015)

This research is carried out to identify the level of teachers’ readiness and factors that correlate teachers’ understanding in implementing 21st century learning.

**Research Objective**

The objectives of this research are

1. Identify the level of teachers’ readiness in implementing 21st century learning.
2. Determine whether there is significant relationship between teachers’ gender and level of understanding related to 21st century learning.
3. Determine whether there is significant relationship between teachers’ academy level and level of understanding related to 21st century learning.
4. Determine whether there is significant relationship between teaching experience and level of understanding related to 21st century learning.
5. Determine the influence of teachers’ academy level in understanding 21st century learning skills.

**Methodology**

This research is a quantitative research in survey design. This research involved 107 teachers from different states in Malaysia.

There are four items correspond to respondents’ demography: gender, age, academy level and teaching experience. There are 15 items related to teachers’ readiness in implementing 21st century learning. The questionnaire used was developed by KPM with validation approved and reliability value greater than 0.60.

**Findings**

Research findings can be categorized into two categories: demography and teacher readiness. Table 1 shows the demography characteristics of the respondents. 107 responses have been collected.
Table 1: Demography Profile of the Respondents

| Demography Profile | Frequency (n) | Percentage (%) |
|--------------------|---------------|----------------|
| Gender             |               |                |
| Male               | 19            | 17.8           |
| Female             | 88            | 82.2           |
| Akademic level     |               |                |
| Certificate        | 3             | 2.80           |
| Diploma            | 5             | 4.67           |
| First Degree       | 79            | 73.8           |
| Master’s Degree    | 20            | 18.7           |
| Teaching Experience|               |                |
| 1 - 5 years        | 8             | 7.5            |
| 6 - 10 years       | 19            | 17.8           |
| 11 - 15 years      | 40            | 37.4           |
| 16 - 20 years      | 31            | 29             |
| Above 20 years     | 9             | 8.4            |

Base on the Table 1, respondents are consisting of 19 (17.8%) male teachers and 88 (82.2%) female teachers. The respondent come from 4 categories of academic level where 3 (2.80%) of the respondents are certificate holders, 5 (4.67%) of the respondents study at diploma level, 79 (3.8%) of the respondent hold first degree and 20 (18.7) of the respondent study to master’s degree level. As for the teaching experience, 8 (7.5%) of the respondents have been teaching for 1 to 5 years, 19 (17.8 %) have been teaching for 6 to 10 years, 40 (37.4 %) have been teaching for 11 to 15 years, 31 (29%) have been teaching for 16 to 20 years while 9 (8.4 %) have been teaching for more than 20 years.

Analysis of Teachers’ Readiness in Implementing 21st Century Learning
Analysis of teachers’ readiness in implementing 21st century learning has been done descriptively. The mean and standard deviation value for each item are analysed and interpreted. Table 2 shows the level of teachers’ readiness in implementing 21st century learning.
| Item                                                                 | Mean (M) | SD    | Interpretation. |
|---------------------------------------------------------------------|----------|-------|-----------------|
| 1. I have excellent understanding about 21st learning skills.       | 2.82     | 0.563 | Moderate        |
| 2. I involve my pupils in activities that promote creativity.       | 3.05     | 0.573 | High            |
| 3. I involve my pupils in activities that promote innovation.       | 2.78     | 0.588 | Moderate        |
| 4. I involve my pupils in activities that promote critical thinking.| 2.84     | 0.632 | Moderate        |
| 5. I involve my pupils in activities that promote problem solving.  | 3.09     | 0.575 | High            |
| 6. I involve my pupils in activities that promote communication and collaboration. | 3.23     | 0.576 | High            |
| 7. I am able to evaluate 21st century skills among the pupils.      | 2.68     | 0.638 | Moderate        |
| 8. 21st century skills are important in determine pupils’ success at workplace in the future. | 2.98     | 0.765 | Moderate        |
| 9. The ministry has clarified the features of 21st century learning.| 3.01     | 0.795 | High            |
| 10. The curriculum promotes 21st century learning.                  | 2.96     | 0.699 | Moderate        |
| 11. I need professional development to increase my knowledge about 21st century skills. | 3.43     | 0.660 | High            |
| 12. I need professional development to build teaching for 21st century pupils. | 3.48     | 0.620 | High            |
| 13. I need professional development in assessing 21st century pupils. | 3.45     | 0.633 | High            |
| 14. Technology plays important part in 21st century learning.       | 3.36     | 0.756 | High            |
I am confident in using technology as a tool in 21st century learning.

| Item | Mean | SD  | Level |
|------|------|-----|-------|
| I am confident in using technology as a tool in 21st century learning. | 3.20 | 0.706 | High |
| Grand Mean | 3.10 | 0.652 | High |

The findings show teachers’ readiness in implementing 21st century learning is high, M = 3.10, SD = 0.652. However, the level of understanding 21st century learning skills among respondents are moderate, M = 2.82, SD = 0.563.

There are different agreement levels among respondents related to involving pupils in the activities that foster five skills in 21st century learning. Respondents show high agreement in fostering three of 21st century learning skills where respondents implemented learning activities that fostering creativity, M = 3.05, SD = 0.573, problem solving, M= 3.09, SD = 0.575 and collaboration and communication, M = 3.23, SD = 0.576. In the other hand, respondents show agreement with moderate level towards involving pupils in learning activities that promote innovation, M = 2.78, SD = 0.588 and critical thinking, M = 2.84, SD = 0.632.

In assessment aspect, respondents show moderate level of agreement related to ability in evaluating 21st century skills among the pupils, M = 2.68, SD = 0.638. Respondent shows agreement at moderate level concern to the importance of 21st century learning in determining pupils career in the future, M = 2.98, SD = 0.765.

Respondents clearly agreed have received explanation about 21st century learning from KPM, M = 3.01, SD = 0.795. However, respondents show agreement at moderate level concern to curriculum applied at school promotes 21st century learning, M = 2.96, SD = 0.699.

According to needs aspect, with high agreement, respondents need professional development in attempt to increase their knowledge related to 21st century learning skills, M = 3.43, SD = 0.660, develop instructions M = 3.48, SD = 0.620 and assessment, M = 3.45, SD = 0.633.

Items analysis related to technology in 21st century learning shows respondents highly agree the importance of technology in 21st century learning, M = 3.36, SD = 0.756 and their confidence in applying technology as tools in teaching 21st century skills, M = 3.20, SD = 0.706.

Correlation Analysis between Gender, Academic Level and Teaching Experience with Level of Understanding 21st Century Learning Skills

Correlation analysis between gender, academic level and teaching experience with level of understanding 21st century learning skills have been determined by using Statistical Package for The Social Science (SPSS) versi 20.0. Significant at an alpha level of 0.05 is applied.

Correlation between Gender and Level of Understanding 21st Century Learning Skills

Correlation between gender and level of understanding 21st century learning skills is determined by using Pearson Correlation test. The analysis result is represented in Table 3.
Table 3: Result of Pearson Correlation (r) between Gender and Level of Understanding 21st Century Learning Skills

| Gender | Understanding 21st century learning skills | Pearson Correlation | Sis. (2-tailed) | N |
|--------|------------------------------------------|---------------------|----------------|---|
|        |                                          | .071                | .468           | 107 |

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3 shows there is no significant correlation between gender and level of understanding 21st century learning skills, (r = 0.071, p < 0.468).

Correlation between Academic Level and Level of Understanding 21st Century Learning Skills

Analysis of correlation between academic level and level of understanding 21st century learning skills is represented in Table 4.

Table 4: Result of Pearson Correlation (r) between Academic Level and Level of Understanding 21st Century Learning Skills

| Academic Level | Understanding 21st century learning skills | Pearson Correlation | Sis. (2-tailed) | N |
|----------------|------------------------------------------|---------------------|----------------|---|
|                |                                          | .218*               | .024           | 107 |

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 shows there is significant correlation between academic level and level of understanding 21st century learning skills, (r = 0.218, p < 0.024).

Correlation between Teaching Experience and Level of Understanding 21st Century Learning Skills

Analysis of correlation between teaching experience and level of understanding 21st century learning skills is represented in Table 5.

Table 5: Result of Pearson Correlation (r) between Teaching Experience and Level of Understanding 21st Century Learning Skills

| Teaching Experience | Understanding 21st century learning skills | Pearson Correlation | Sis. (2-tailed) | N |
|---------------------|------------------------------------------|---------------------|----------------|---|
|                     |                                          | -.072               | .460           | 107 |

*. Correlation is significant at the 0.05 level (2-tailed).
Table 5 shows there is no significant correlation between gender and level of understanding 21st century learning skills, \( r = -0.072, p < 0.46 \).

**ANOVA Analysis of Academic Level Toward Understanding 21st Century Learning Skills**

One-Way Analysis of Variance of Academic Level in this research is represented in Table 6.

**Table 6: One-Way Analysis of Variance of Academic Level**

| Source            | \( df \) | SS    | MS    | \( F \) | \( p \) |
|-------------------|----------|-------|-------|---------|--------|
| Between groups    | 3        | 2.867 | .956  | 3.200   | .026   |
| Within groups     | 103      | 30.759| .299  |         |        |
| Total             | 106      | 33.626|       |         |        |

Generally, there was a statistically significant difference between groups of academic level as determined by one-way ANOVA \( (F (3,103) = 3.200, p = .026) \).

**Table 7: Multiple Comparisons of Academic Level**

| (I) Academic Level | (J) Academic Level | Mean Difference (I-J) | Std. Error | Sig. |
|--------------------|--------------------|-----------------------|------------|------|
| Certificate        | Diploma            | -1.000                | .399       | .065 |
| First Degree       | - .797             | .321                  | .069       |
| Master’s Degree    | -1.000*            | .338                  | .020       |

*. The mean difference is significant at the 0.05 level.

A Tukey post hoc test revealed that academic level was statistically significantly increase the level of understanding 21st century learning skills where master’s degree holder \( (3.00 \pm 0.562\ min, p = .020) \) compared to the certificate holder \( (2.00 \pm 0.00\ min) \). There was no statistically significant difference between the certificate holder compared to diploma holder \( (p = .065) \) or first degree holder \( (p = 0.069) \).

**Discussion**

Considering the grand mean value, teachers are ready to implement 21st century learning but teachers’ understanding related to 21st skills is at moderate level. Teachers are eager to implement 21st century learning but their understanding towards 21st skills stil not enough to enable their best teaching practice. Teachers need profession development to improve their understanding. With higher understanding, teachers able to teacher effectively since understanding influence how a teacher acts, make descisions and apply teaching practice \( (Carlgren, 2013; Amran & Rosli, 2017) \).
Teachers are good in creating learning activities that promote creativity, problem solving and communication and collaboration with high agreement but show moderate agreement in promoting innovation and critical thinking. A research carried out by Osman and Basar (2016) has withdrawn the same result that teachers face the most challenges in fostering innovation and critical thinking compared to other skills.

Teachers also show moderate agreement in ability to assess 21st century skills among their pupils. These findings are supported by Veloo, Krishnasamy and Ali (2017) where their respondents have shown moderate agreement regarding to understanding the implementation of assessment. Assessing 21st century learning involves the evaluation of many skills and not just paper-pencil exam. Teachers need appropriate tools to assesst the different skills.

The information delivered by ministry corresponding to 21st century learning has been received by teachers but unable to result the best practice since the current curriculum not really support teacher to optimise their teaching process. Teachers show moderate level related to how far current curriculum supports 21st century learning. The curriculum is so compact and influence teachers’ creativity in conducting teaching and learning (Rajendran, 2001; Saad, Saad & Dollah, 2012).

Teachers are highly agreed that they need professional development in three aspects which are related to knowledge, teaching and assessment in 21st century learning. Rajendran (2001) suggested that teachers should be provided i) well-prepared course, ii) a support system consists of references, resources to be used in implementing teaching and learning and iii) a platform to discuss any issue related to their teaching.

Correlation test shows that among gender, academic level and teaching experience only academic level influences the level of teachers’ understanding in implementing 21st century learning. The level of understanding 21st century learning between the lowest and the highest academic level teachers are significantly different where teachers with master’s degree understand 21st century learning skills better than teachers with certificate.

The implication of this study is teachers are ready to implement 21st century learning but still needs improvement to optimise the outcomes. Teachers are clearly need professional development and policy maker such as Pejabat Pendidikan Daerah (PPD), Jabatan Pelajaran Negeri (JPN) and KPM should concern about this and fulfill the needs.

**Conclusion**

Teachers are responsible on how success the implementation of 21st century learning. Teachers’ perception, knowledge, skills and practice influence the effectiveness of their teaching. Teaching in 21st century is quite challenging where teachers should concern the 4Cs learning skills: creativity, communication, collaboration and critical thinking. Teachers should be provided with opportunities to develop their profession since they are confident that profession development may help them enrich their knowledge and increase their capability in teaching and assessing.
Teachers need resources and references to support their teaching. Teachers need guidance that may promote their creativity in planning effective, meaningful and fun teaching techniques.

Teachers cannot stand alone in implementing effective 21\textsuperscript{st} century learning. One of the most effective ways to support the teachers is by providing a teaching module that suggests activities related to 21\textsuperscript{st} century learning skills. The module is practical that teachers can use the activities suggested immediately. In addition, teachers can adopt or adapt the suggested activities to new activities to make it meaningful in their teaching.

The teaching module should enable teachers to foster 4Cs 21\textsuperscript{st} century skills. The suggested activities are hands-on where pupils involve in the activities actively and all pupils get chance to contribute to the activities outcomes. Pupils cooperate in group activities and this will help teachers promote communication and collaboration skills. Besides hands-on activities, the module should offer ICT-based activities since ICT skills is one of the 4Cs skills. The hands-on and ICT-based activities in the module can promote pupils’ creativity, innovation and problem solving skills.

In conclusion, the module offers the best solution in increasing teachers’ ability as an effective 21\textsuperscript{st} century educator. The module enables teachers to implement learning activities that promote 4Cs learning skills and evaluate pupils’ performance.

The activities offered are appropriate as tools for assessing how far the pupils have mastered 4Cs 21\textsuperscript{st} skills. This will overcome the teachers’ problem in evaluating the 4Cs skills among their pupils. The module may ensure the best practice pedagogy among teachers in 21\textsuperscript{st} century classrooms.

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