

'SKPMg2' (Standard 4) as tools to upgrade teachers' teaching quality

Wan Norhasma Wan Hassan¹ & Nurahimah Mohd Yusoff²
^{1,2}University Utara Malaysia

Article Info

Received:

14 March 2019

Accepted:

02 April 2019

Publish

15 April 2019

E-mail address:

*corresponding Author :

* whasma@yahoo.com

Abstract

Teaching in schools nowadays are so challenging. Besides teaching, the teachers need to always be prepared and professionally develop themselves for the changes and tasks in the curriculum. 'SKPMg2' (Standard 4) is one of the tools introduced by the Ministry of Education to be applied in schools for all teachers. This study is to see how 'SKPMg2' (Standard 4) is used by the teachers in school as guidelines in their planning and teaching in the classrooms. With the help by the school coaches (SISC+) the teachers are guided on how to effectively use the form in their teaching. A total of 126 respondents from all over the country gave their responses on the usage of 'SKPMg2' (Standard 4) as guidelines in their classroom teaching. The result of the analysis will reflect the importance of the form and the understanding of teachers in using the selected it as to upgrade their standard of teaching. Apart from that, it will give some useful insight and reflection towards the usage of 'SKPMg2' (Standard 4) in the teaching profession in the country.

Keyword: 'SKPMg2'(Standard4), Guidelines, Teaching Quality

Introduction

The development in the 21st century education has brought many changes in the Malaysian education system. The Ministry of Education itself has given about tremendous effort in supporting and providing resources to the state and district education departments, the schools and most importantly to the teachers in schools. Those efforts are for the teachers to focus on their main business in delivering meaningful and affective teaching and learning as required in the 21st century education (Getenet, Beswick, & Callingham, 2016). Therefore, the latest plan in shaping the new form of education in the country is the Malaysia Education Blueprint 2013-2025. Through the blueprint, one of the main objectives in understanding the current performance and challenges is, raising the teachers' standard or the teachers' quality. It is very important for the education system to develop parallel to what is required in the development of the nation. So, based on the need to upgrade the teaching quality of the teachers, 'SKPMg2' has been implemented since March 2017. It is a self-assessment tool for more systematic management and help schools determine their strengths and weaknesses for improvement. There are 5 standards of management tools representing the 'SKPMg2' as a whole but, only one will be discussed for the purpose of this study which is the 'SKPMg2' (Standard 4). It is the guidelines and the controlled standard for teachers to plan and control their classroom teaching. At the beginning of the implementation and to understand on how to use the form, the teachers are guided by the school improvement specialist coaches (SISC+), for them to really understand their role outlined in

SKPMg2 (Standard 4). The objectives of this study is to see the teachers understanding on SKPMg2 (Standard4) form in their practices of teaching and learning; and to see the need of the particular form in their lesson plans and practices. So, based on that the teachers could significantly measure and decide on their classroom teaching as required by the Ministry of Education.

The purpose of this study is to see how SKPMg2 (Standard 4) is used by the school coaches to help teachers in upgrading their teaching qualities. Additional to that, to analyze how far teachers understand the importance of the form as their guidelines in classroom teaching practices. Based on that, the objectives of this study is:

- 1) To examine teachers' perceptions in implementing SKPMg2 (Standard 4) in their teaching practices.

So, the research questions for the study is;

- 1) To what extend teachers perceived their roles in implementing SKPMg2 (Standard 4) in their classroom teaching?

Operational Definition in this study will highlight the three phrases which are the 'SKPMg2' (Stabdard 4), guidelines and teaching quality. The 'SKPMg2' (Standard 4) here stands for '*Standard Kualiti Pendidikan Malaysia gelombang ke 2*' and Standard 4 is referring to the standards outlined for classroom teaching and learning. The guidelines are referring to the certain rules and the principles of the classroom teaching and learning activities which are based on the standard documents in the curriculum. Whereas, the teaching quality is the meaningful classroom teaching and learning practiced by the teacher.

The study is important as it helps to encourage active and meaningful teaching and learning. Meaning that, the teacher should prepare for their work when they enter a classroom in order for them to take an active role in inquiring and performing the meaningful teaching. The use of 'SKPMg2' (Standard 4) form will benefit both teachers as well as coaches in maintaining the standard of classroom practices.

Literature Review

The professional standards of teaching and learning is based on the essential elements of every teacher's work which include the pedagogical aspects, skills, content knowledge, leadership, collaboration in term of Professional Learning Community (PLC) and innovation. A teacher is required to show consistently high standards in terms of personal behaviour as well as the professional conduct (Stronge, Ward & Grant, 2011). The standards in this profession has been developed parallel to the need of education and to be practiced by teachers as to be relevant to todays need in education as a whole.

Apart from that, in term of quality, teachers must have a knowledge of the relevant subjects and curriculum areas as to maintain their pupils' interest in the subject (Tosto et al., 2016). They also should know how to address any misunderstandings and able to demonstrate crucial understanding of the developments in the subject they teach and in curriculum aspects (Clarke & Braun, 2013). In addition, teachers also need to adapt teaching to respond to the need of all pupils (Vernier, 2015). Those qualities will help to contribute to the development of the teaching profession in the country. A good quality teacher has an effective discipline skill and he/she is able to promote positive vibes and change in the classroom. He/she also need to have classroom management skills which will ensure the result of good student behavior, effective study and work

habits, and an overall sense of respect in the classroom (Abd Hamid, Siti Rafiah, Sharifah Syed Hassan and Nik Ahmad Ismail, 2013).

The second wave of Malaysia Education Quality Standard (SKPMg2) is to ensure the transformation efforts of the country's education for it to be in line with the need for education at a global level. It is a self-assessment tool to ensure more systematic management and help the schools identify their strengths and weaknesses. Those management is important for the school for improvement (Keupp, Palmié & Gassmann, 2012). This study is exploring on SKPMg2 (Standard 4) which focusing in classroom teaching and learning. This is a self-monitoring tool which could encourage teachers to deliver their best performances in teaching and learning. The use of this form as guideline for teachers to plan their lessons and practically doing the teaching. Those guidelines will help them to assist and assess their own performances for them to reflect and improvise if necessary (Caughlan & Jiang, 2014). It also in other words will assist them to identify strengths and weaknesses for improvement.

Methodology

This study employs a survey-research design via online questionnaires. A set of questionnaires regarding knowledge and the understanding of 'SKPMg2' (Standard 4) form was created online through the Google Form survey application. The survey then was posted through a teachers' *WhatsApp* group. The instrument was adapted from the Comprehensive Professional Development Survey, done by Kehn (2016) and also based on the constructs of 'SKPMg2' (Standard 4). A total of 130 respondents answered the survey via online. However, only 126 of responses completed and were selected to be analyzed in this study. The figure below shows the development of the final sample size for the survey.

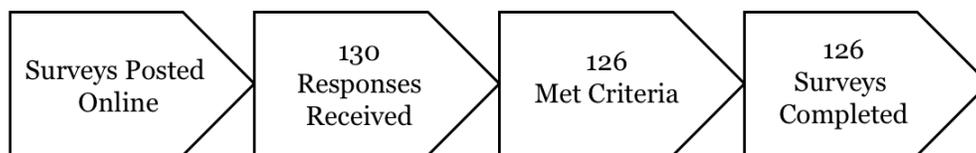


Figure 1: Process for initial responses selection

The 10 items of the questionnaire were developed specifically to measure the major finding in this study. Those items are spread into three variables which are the impact of coaching, teacher's practices and students' achievement. They are mainly to address research objectives with regard to teachers' perception on use of 'SKPMg2' (Standard 4) form in their classroom teaching. Item number 1 to 4 are the impact of coaching on teachers that made them aware the function of 'SKPMg2' (Standard 4) on them. Although the item number 2 and 4 are about the teachers' roles which is more to teachers' practices but in this study, those items are categorized under the impact of coaching because it shows how far teachers know and understand their particular roles after the effective coaching session with their coaches. The second variable is highlighted in item number 5 to 9 which are about the teachers' understanding on their specific roles based on 'SKPMg2' (Standard 4) and guidelines for their professional development. So, items number 1 to 9 here are representing the independent variable. Whereas, item number 10 which measures the positive change in students' achievement is the dependent variable. Item number 1 is a question for a yes/no answer and item number 2 to 9 were rated on 4-point Likert scales ranging from Strongly Disagree to Strongly Agree and the value for each range are 1, 2, 3 and 4.

Table 1: The items/constructs and variables

No	Items/Construct	Variables
1	I know about the usage of 'SKPMg2' (Standard 4) form in my school.	
2	The teacher's role outlined in SKPMg2 (Standard 4) form helps my classroom teaching and learning.	<i>Impact of Coaching</i>
3	The standard guidelines in SKPMg2 (Standard 4) could help me in developing my teaching performance.	
4	The teacher's role outlined in SKPMg2 (Standard 4) helps me to implement the 21 st century teaching and learning.	
5	I do understand the teacher's role as the classroom PLANNER.	<i>Teacher's Practices</i>
6	I do understand the teacher's role as the classroom CONTROLLER.	
7	I do understand the teacher's role as the classroom GUIDE.	
8	I do understand the teacher's role as the classroom MOTIVATOR.	
9	I do understand the teacher's role as the classroom ASSESSOR.	
10	STUDENT AS ACTIVE LEARNER shows that my teaching and learning is good and effective.	<i>Students' Achievement</i>

Data analysis in this study is referring to the quantitative data from the participants were collected to be analyzed using the Microsoft Excel Application version 15.26(160910). The responses to analyze are ranked based on Likert scales combining 'Disagree' and 'Strongly Disagree' as negative responses and 'Agree' and 'Strongly Agree' as positive responses. The analysis includes descriptive and also the inferential analysis. The descriptive analysis is used on order to analyze the frequency and percentage of all the respondents in demographic background. Other than that, it is also used to clarify the mean, percentage, frequency and standard deviation. Whereas, the inferential statistics, the t-test is used to analyze the research findings.

Descriptive statistical analysis was used to compare the mean score of the 10 survey items which pertaining to the teachers' understanding on the use of 'SKPMg2' (Standard 4) in their teaching practices. It is also to analyzed the mean percentage of the participants' responses who agree (A) or strongly agree (SA) to each item.

A pilot study was conducted earlier to examine the reliability of the study prior to the actual study. The validity of the instrument also had been clarifying by one of the officers of School Improvement Partners, a qualified person who formally involved in building the 'SKPMg2' instruments. The reliability of the data collected were depending on the first part of the responses in the survey where the respondent need to clarify their names, schools and also the state where they work. Those to make sure the respondents are all teachers. The data then were reviewed and clarified by the academic officers in ICT department and Academic Department of the local District Education Office.

Results and Discussion

The data received from the 126 responses were analyzed. The respondents were all teachers from 11 states in the country. Although it is not the total number of the whole 16 states and federal territories in Malaysia but it covered almost 69% of all the states. The states and number of responses are from Johor(13), Melaka(9), Negeri Sembilan(5), Pahang(16), Perak(10), Pulau Pinang(7), Sabah(11), Sarawak(6), Terengganu(13), Kelantan(21) and Selangor(15). The number of responses received from Kelantan state is the most, which is 21 responses and the least is from Negeri Sembilan state, which is only 5 responses received. These demographics of the data are shown in chart in figure 2 below.

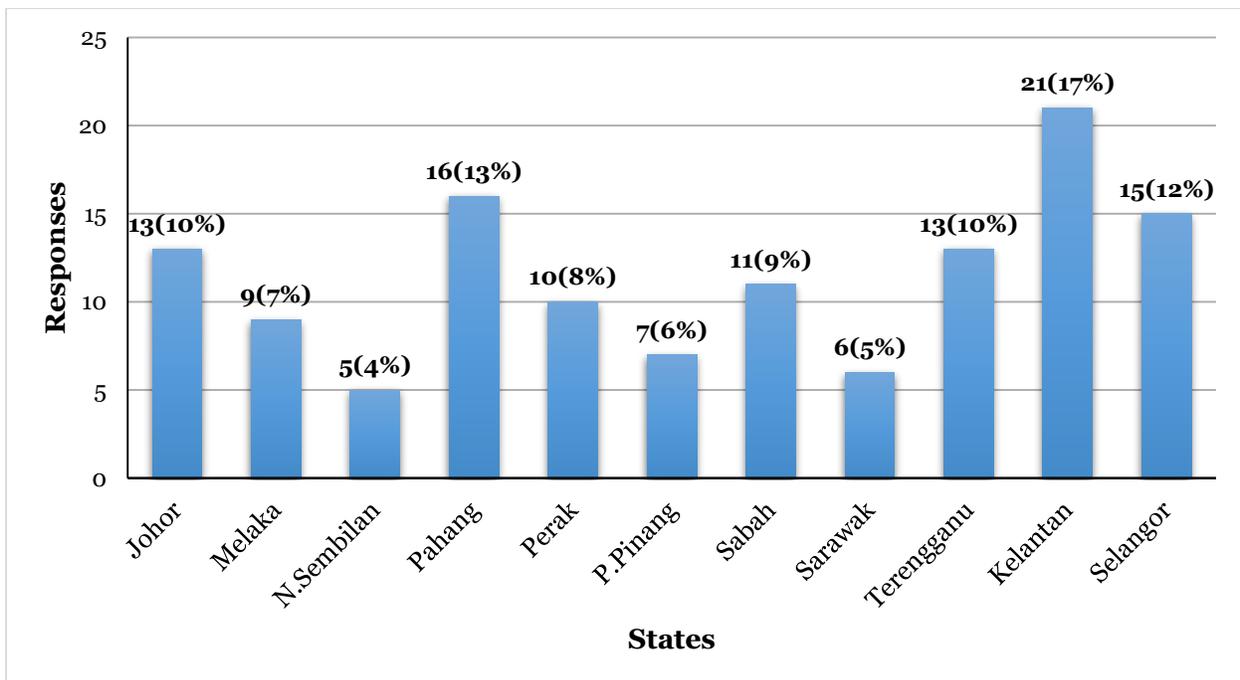


Figure 2: Responses demographics

The result of the evaluation was analyzed through the online survey in *Google Form* and by using *Microsoft Excel* application. As stated earlier, there are 10 items/constructs listed in the survey questionnaires. Item number 1 is showing the result from yes/no responses from 126 participants. It is separate from item number 2 to 9 because it is not based on the Likert Scale 1 to 4. The mean score for item number 1 is 1.98 and the standard deviation is 0.18. It shows that 100% of the respondents' answers showing that they know about the use of SKPMg2 (Standard 4) form in their school.

Table 2: Data collected from online survey of teachers understanding on SKPMg2 (Standard4).

Items/ Construct	NO(%)	YES(%)	N(%)	Mean	Standard Deviation
1	0(0)	126(100)	126(100)	1.98	0.18

Item number 2 to 9, the mean score is between 2.94 and 3.25, and the standard deviation is between 0.56 to 0.62. For the second item: The teacher's role outlined in SKPMg2 (Standard 4) form help teachers in classroom teaching and learning, 86.5% agree and strongly agree, and the standard deviation is 0.59. The third item: 80.5% of the respondents agree and strongly agree that the standard guidelines in 'SKPMg2' (Standard 4) could help them in developing their teaching performances. The standard deviation for item 3 is 0.61. In item number 4: The teacher's role outline in 'SKPMg2' (Standard 4) could help the teacher to implement the 21st century teaching and learning, 93% of the respondents agree and strongly agree, with standard deviation of 0.62. As for item number 5: The teacher understands their role as the classroom PLANNER, 96.1% of the respondents agree and strongly agree with the standard deviation of 0.59. In item number 6: Teacher do understand his/her role as classroom CONTROLLER, 96.3% of them agree and strongly agree with standard deviation of 0.60. Item number 7: Teacher do understand his/her role as the classroom GUIDE, 96.8% agree and strongly agree with that, and the standard deviation is 0.57. Item number 8: The teacher understands his/her role as classroom MOTIVATOR, 98.4% agree and strongly agree with standard deviation of 0.56. For item number 9: Teacher do understand his/her role as the classroom ASSESSOR, 95% agree and strongly agree with standard deviation of 0.59. Finally, for item number 10: STUDENT AS ACTIVE LEARNER to show the teaching and learning is good and effective, 86.5% agree and strongly agree with it and the standard deviation is 0.58.

The participants' responses percentage for each range from strongly disagree to strongly agree are shown in table 2. From the data, it shows that 100% of the participants knew about SKPMg2 (Standard 4) form which being used in their school. This is based on item number 1 when all of the 126 responses answered 'yes' to the it. Whereas, for item number 2 to 9, Linkert scale SD is labeled for Strongly Disagree, D is for Disagree, A is for Agree and SA is for strongly Agree. The average of 0.1 (0.08%) and 9.67 (7.67%) of the participants were strongly disagree and disagree with the content and the usage of the form in their teaching and learning practices. While 92.15% of the respondents were either agree (69.58%) and strongly agree (22.57%) with the 'SKPMg2' (Standard4) used in their school. From the data, percentage, mean score and standard deviation, it showed that the respondents do agree with teacher's role outlined in SKPMg2 (Standard 4) form which could help them in classroom teaching and learning. The most number of responses (93/126) showing there. It showed that the teachers are strongly believe that the use of 'SKPMg2' (Standard 4) form is beneficial for quality of their classroom teaching. They also understand their roles as the planner, controller, guide, motivator and assessor in the classroom. Other than that, the data also showed that the teacher believe that when the students as active learner it will indicate their teaching is good and affective. The responses for that point is 91/126. Finally, with the use of 'SKPMg2' (Standard 4) form as guideline, they could implement the 21st century based teaching and learning.

Table 3: Data collected from online survey of teachers understanding on SKPMg2 (Standard4).

Items/ Construct	SD(%)	D(%)	A(%)	SA(%)	N(%)	Mean	Standard Deviation
2	0(0)	17(13.5)	93(73.8)	16(12.7)	126(100)	2.97	0.57
3	1(0.8)	20(16)	88(67)	17(13.5)	126(100)	3.02	0.61
4	0(0)	9(7)	91(72)	26(21)	126(100)	2.94	0.62
5	0(0)	5(4)	85(67.5)	36(28.6)	126(100)	3.22	0.59
6	0(0)	5(4)	81(64.3)	40(32)	126(100)	3.25	0.60
7	0(0)	4(3.2)	87(69)	35(27.8)	126(100)	3.22	0.57
8	0(0)	4(3.2)	90(73)	32(25.4)	126(100)	3.20	0.56
9	0(0)	6(4.8)	87(69)	33(26)	126(100)	3.19	0.59
10	0(0)	17(13.5)	87(69)	22(17.5)	126(100)	3.11	0.58
%	0.08	7.67	69.58	22.57	100	3.01	

To interpret the level of teachers' understanding and how much they comprehend the 'SKPMg2' (Standard 4) in their teaching practices, the three groups of variables had shown the moderate mean scores between 3.11 and 3.73. Those three variables are the impact of coaching, teacher's practices and the students' achievement. The impact of coaching variable mean score is 2.73, which is moderate. As for the teacher's practices variable, the mean score is 3.22, which is high level and for students' achievement variable, the mean score is 3.11 which is also consider as high level.

Table 4: Mean score and standard deviation

Variables	Mean	Standard Deviation
Item 2	2.97	0.57
Item 3	3.02	0.61
Item 4	2.94	0.62
Impact of coaching	2.73	0.50
Item 5	3.22	0.59
Item 6	3.25	0.60
Item 7	3.22	0.57
Item 8	3.20	0.56
Item 9	3.19	0.59
Teacher's practices	3.22	0.58
Item 10	3.11	0.58
Students' achievement	3.11	0.58

As to answer the research questions for this study, to see how the teachers use 'SKPMg2' (Standard 4) as guideline for classroom teaching, it is clearly showing through their acceptance on each element in the form. It is also based on teachers' understanding on what they should do for the classroom teaching and learning. The second question is to find out what elements in 'SKPMg2' (Standard 4) is important in upgrading teachers' performances? So, based on the result, the answers for that reflected on the variables teachers' practices and students' achievement. Those variables showed that the teachers' understanding on their roles and also the changes in students' behavior to be the most important elements in 'SKPMg2' (Standard 4) in upgrading the teachers' performances.

The recommendation for the future study, based on the result of this study, where it showing the very high positive responses from the participants regarding coaching and the elements in 'SKPMg2' (Standard 4) form but, it is not enough to reflect what teachers really practice in the classroom. So, the future study should be done to investigate on the interventions and the best practices that teachers do in the classroom. Besides that, other study also should be done to see what are the best coaching practices in school which could enhance the teachers' professional development.

Conclusion and Recommendation

The use of 'SKPMg2' (Standard 4) as guideline and tool for teachers' classroom practices can be consider as one of the effective ways to improve the quality of teaching in a classroom. Based on that also teachers could guide their students to be creative and active learners rather than simply be spectators. With all teachers' roles and the standard outlined in SKPMg2 (Standard 4), the teachers could create an active learning in the classroom. The students will actively participate in the class, engaged with the material and collaboratively work with each other as part of the learning process. By having a good relationship between coaches-teachers, and teachers-students, it will offer opportunities for the teachers and students to be motivated and fully engaged in the learning process (Da Luz, F, 2015). Based on that also the teachers should always be creative to look at ways to facilitate independent, critical, and creative thinking by using active learning techniques. Creativity has many positive outcomes in teaching. Therefore, teachers need to know when, how, where and why they need to be creative in the classroom teaching (Kaufman & Beghetto, 2013). Other than that, it shows the development of the support system in schools. Those supports and resources has been promoted by The Ministry of Education for the schools to play an important role on how teachers and schools should perform. Those support also will enable teachers to understand and their core business of delivering the meaningful and effective teaching and learning.

From the findings also showing that, the teachers' role as a class Controller is the most prominent role compared to the four listed roles. This is not actually expected with SKPMg2 (Standard 4) as a guideline for teachers' teaching practices. The roles as a planner, guide, motivator and assessor also need to be hold as the main classroom practices for the teachers. So, it is strongly recommended here that the coaching process in school should highlight more in giving the ideas and more input for the teachers in schools for them to really understand all their significant roles in the classroom. This professional development is to support the teachers' leaning process and the students' development as to prepare them for their 21st century skills (Darling-Hammond, Hylar & Gardner, 2017). Based on that, the further study in this field should focus on the main coaches and teachers' practices as to know what other element can be used to enhance the process of coaching as well as the effective classroom teaching and learning.

References

- Abd Hamid, S. R., Syed Hassan, S., & Ismail, N. A. (2013). Teaching Quality and Performance Among Experienced Teachers in Malaysia. *Australian Journal of Teacher Education*, 37(11). <https://doi.org/10.14221/ajte.2012v37n11.2>
- Ahmad Rusli bin Din. (2018). Kepimpinan Instruksional, PAK-21 DAN SKPMg2: Dapatan Nazir. In *Kepimpinan Instruksional menjana pembelajaran abad ke-21*. Ketua Nazir, Jemaah Nazir dan Jaminan Kualiti Negeri Kedah.
- Alazam, Abu-Obaidah, A. R. Bakar, R. Hamzah, and S. Asmiran. 2013. "Teachers' ICT Skills and ICT Integration in the Classroom: The Case of Vocational and Technical Teachers in Malaysia." *Creative Education* 03 (08). Scientific Research Publishing, Inc.: 70–76. doi:10.4236/ce.2012.38b016.
- Arden, C. H., Danaher, P. A., Jones, J. K., De George-Walker, L., Matthews, K. J., Davies, A., ... Midgley, W. (2016). Professional Learning and Development. In *Educational Learning and Development* (pp. 41–53). Palgrave Macmillan UK. https://doi.org/10.1057/9781137392848_4
- Caughlan, S., & Jiang, H. (2014). Observation and Teacher Quality: Critical Analysis of Observational Instruments in Preservice Teacher Performance Assessment. *Journal of Teacher Education*, 65(5), 375–388. <https://doi.org/10.1177/0022487114541546>
- Cheng, M. Y., Chan, W. S., & Mahmood, A. (2009). The effectiveness of entrepreneurship education in Malaysia. *Education and Training*, 51(7), 555–566. <https://doi.org/10.1108/00400910910992754>
- Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Over-coming challenges and developing strategies for effective learning. *The Psychologist*, 26(2), 120–123. <https://doi.org/10.1191/1478088706qp0630a>
- Coyle, D. (2005). Planning tools for teachers. Retrieved August, 1–17. Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Planning+Tools+for+Teachers#9>
- Da Luz, F. S. R. (2015). The relationship between teachers and students in the classroom : Communicative language teaching approach and cooperative learning strategy to improve learning. In BSU Master's Theses and Projects.
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute (pp. 1–3). <https://doi.org/10.1016/j.fusengdes.2007.07.052>
- DeMonte, J. (2013). High-Quality Professional Development for Teachers. *Supporting Teacher Training To Improve Student Learning*, (July), 12. <https://doi.org/10.1093/mollus/eyi069>

- Desimone, L. M., & Pak, K. (2017). Instructional Coaching as High-Quality Professional Development. *Theory into Practice*, 56(1), 3–12.
<https://doi.org/10.1080/00405841.2016.1241947>
- Feng, L., & Sass, T. R. (2017). Teacher quality and teacher mobility. *Education Finance and Policy*, 12(3), 396–418. https://doi.org/10.1162/EDFP_a_00214
- Getenet, S. T., Beswick, K., & Callingham, R. (2016). Professionalizing in-service teachers' focus on technological pedagogical and content knowledge. *Education and Information Technologies*, 21(1), 19–34.
- Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, 4(2), 38–57. Retrieved from <http://bit.ly/2fRI88H>
- Goh, P. S. C., & Wong, K. T. (2014). Beginning teachers' conceptions of competency: Implications to educational policy and teacher education in Malaysia. *Educational Research for Policy and Practice*, 13(1), 65–79. <https://doi.org/10.1007/s10671-013-9147-3>
- Goh, P. S. C., & Blake, D. (2015). Teacher preparation in Malaysia: needed changes. *Teaching in Higher Education*, 20(5), 469–480. <https://doi.org/10.1080/13562517.2015.1020780>
- Gray, D. E. (2007). Facilitating management learning: Developing critical reflection through reflective tools. *Management Learning*, 38(5), 495–517.
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence Based Nursing*, 18(3), 66–67.
- Hughes, J., Morrison, L., & Dobos, L. (2018). Re-making teacher professional development. In *Studies in Health Technology and Informatics* (Vol. 256, pp. 602–608). IOS Press. <https://doi.org/10.3233/978-1-61499-923-2-602>
- Hung, M. L. (2016). Teacher readiness for online learning: Scale development and teacher perceptions. *Computers and Education*, 94, 120–133.
<https://doi.org/10.1016/j.compedu.2015.11.012>
- Kaufman, J. C., & Beghetto, R. A. (2013). In Praise of Clark Kent: Creative Metacognition and the Importance of Teaching Kids When (Not) to Be Creative. *Roeper Review*, 35(3), 155–165.
- Kennedy, M. M. (2016). How Does Professional Development Improve Teaching? *Review of Educational Research*, 86(4), 945–980.
- Keupp, M. M., Palmié, M., & Gassmann, O. (2012). The Strategic Management of Innovation: A Systematic Review and Paths for Future Research. *International Journal of Management Reviews*, 14(4), 367–390.
- Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: Effects on instructional quality and student

- development. *Journal of Educational Psychology*, 105(3), 805–820.
<https://doi.org/10.1037/a0032583>
- Lokman Mohd Tahir, & Kalsom Saleh. (2011). Implikasi Latihan Dalaman Kepada Guru-Guru Sekolah Rendah. *Journal of Science & Mathematics Education*, 1–9.
- Malaysia Education Blueprint, M. (2013). Malaysia Education Blueprint 2013 - 2025. *Education*, 27(1), 1–268. <https://doi.org/10.1016/j.tate.2010.08.007>
- MOE Malaysia. (2016). Quick facts Malaysia educational statistics 2016. *Educational Planning and Research Division, Ministry of Education Malaysia*, 1–45. Retrieved from <http://www.moe.gov.my>
- Osman, K., Hamid, S. H. A., & Hassan, A. (2009). Standard setting: Inserting domain of the 21st century thinking skills into the existing science curriculum in Malaysia. *Procedia - Social and Behavioral Sciences*, 1(1), 2573–2577.
<https://doi.org/10.1016/j.sbspro.2009.01.454>
- Reinke, W. M., Stormont, M., Herman, K. C., & Newcomer, L. (2014). Using Coaching to Support Teacher Implementation of Classroom-based Interventions. *Journal of Behavioral Education*, 23(1), 150–167. <https://doi.org/10.1007/s10864-013-9186-0>
- Rhodes, C., & Beneicke, S. (2002). Coaching, mentoring and peer-networking: Challenges for the management of teacher professional development in schools. *Journal of In-Service Education*, 28(2), 297–310. <https://doi.org/10.1080/13674580200200208>
- Roberts, P., Priest, H., & Traynor, M. (2013). Reliability and validity in research. *Nursing Standard*, 20(44), 41–45.
- Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of Teacher Self-Efficacy and Relations With Strain Factors, Perceived Collective Teacher Efficacy, and Teacher Burnout. *Journal of Educational Psychology*, 99(3), 611–625. <https://doi.org/10.1037/0022-0663.99.3.611>
- Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What makes good teachers good?: A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education*, 62(4), 339–355.
- Timperley, H. S. (2015). Continuing Professional Development. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (pp. 796–802). Elsevier Inc.
<https://doi.org/10.1016/B978-0-08-097086-8.92134-2>
- Tosto, M. G., Asbury, K., Mazzocco, M. M. M., Petrill, S. A., & Kovas, Y. (2016). From classroom environment to mathematics achievement: The mediating role of self-perceived ability and subject interest. *Learning and Individual Differences*, 50, 260–269.
- Vernier, D. (2015, December 1). Teaching with technology. *Physics World*. Institute of Physics Publishing. <https://doi.org/10.1088/2058-7058/28/12/45>
- Visioli, A., & Zhong, Q. C. (2011). Quantitative analysis. In *Advances in Industrial Control* (pp. 213–228). Springer International Publishing. https://doi.org/10.1007/978-0-85729-070-0_11