

Professional Management Competency for TVET Teachers in Engineering Faculty at Vocational College

Khamsiah Ismail, Muhd Khaizer Omar, Arnida Abdullah

Faculty of Education Studies, Department of Science and Technical Education, University Putra Malaysia, 43400, UPM Serdang, Selangor, Malaysia.

Email: khamsiahikhamsiah@gmail.com

To Link this Article: <http://dx.doi.org/10.6007/IJARPED/v8-i4/6433>

DOI:10.6007/IJARPED/v8-i4/6433

Published Online: 13 September 2019

Abstract

This study aims to explore the professional management of competencies among the TVET teachers in faculty of engineering at vocational college. Qualitative approaches were involved with case study and using a set of interview questions as a semi-structured interview guide for obtaining the data. A total of seven respondents from three vocational college in Selangor were involved in this study. Three respondent were selected from among the teachers, three respondents among the final year students who were on job training in industries and one of the director at vocational college. Instruments used in this study are questionnaires with semi structured, observations and documents analyzed. The data collected were analyzed using the N-vivo software application to answer the research questions related to this study. The results show that the components of competency needed were collaboration management, student management, workshop and classroom management, teaching preparation management, program and activity management and also documentation and reporting management

Keywords: Professional Management Competencies, TVET Teachers in Faculty of Engineering, Vocational College, Technical and Vocational Education.

Introduction

The Malaysia Education Development Plan (PPPM) 2013-2025 focused on development of teachers professionalism standard (Malaysia Education Ministry, 2013). Therefore, it is important for TVET teachers strive to enhance excellence in the requirements of competence in order to uphold the educational profession especially in the provision of human capital .. Vocational skills that require highly qualified, confident and credible teachers are key milestones (Hayati, Zuraidah & Sufean, 2017). This has been a vision and responsibility under the Ministry of Education Malaysia (MOE) and the Technical and Vocational Education Division (BPTV).

Therefore, it is imperative for teachers to improve their quality by possessing all the components of competency including knowledge and skills as well as personal qualities in professional management work. It is also emphasized by Lis, Rohana and Amiruddin (2011)

that knowledge and skills must be bestowed on students to produce quality human capital and quality human resources in engineering especially in meeting current industry needs. However, issues regarding TVET educator quality are often discussed where the quality and eligibility of TVET educators remains an unresolved issue and this is acknowledged by Bauer (2007) and in line with Mahazani (2011) who argues that TVET teacher competence and professionalism are still are at a disadvantage.

Through the TVET Transformation Plan, various efforts have been made to realize the mission and vision of the MOE and in particular, through strengthening the TVET institutions, especially vocational colleges in Malaysia, ensuring that teachers are fully qualified and equivalent and ready to advance in the relevant fields. (BPTV, KPM 2012). In line with the statement cited by Nur Mustafa (2013) stated that one of the most important competencies for teachers is competency in management work. However, there are still issues regarding this issue as the knowledge and skills of TVET lecturers in vocational colleges are at a moderate level (Jamaliah, 2014) This study also supported by Khairul, Yusri and Norazrena (2015). said that TVET teachers in vocational colleges are weak in managing the equipment, managing in teaching materials and also teaching and learning management that have made students less interested and bored.

Based on past research and the issues identified, it is advisable to conduct a professional management study to answer the research questions. Therefore, the purpose of this study is to explore and deepen the professional management experience required by TVET faculty in engineering at vocational colleges to develop a professional management competency framework as a guide and reference in improving the competencies.

Literature Review

Definition of Management Competency

Competence is defined as a harmonious combination of the components of knowledge, skills and personal characteristics that individuals must possess in performing their tasks (Sedah & Mohammad Sani 2012). Therefore, management work is an important task that educators make as a great contribution and can be used by all parties such as students, teachers and institutions as well as the profession and able to assess the competence of a teacher. Nur Mustafa (2013) emphasizes that competent teachers are knowledgeable, knowledgeable in personnel, skilled in teaching aids, and effective in managing classes or workshops.

Competency Spencer (1993)

The competence component is divided into three main components of knowledge, skills and personal characteristics. Knowledge is the ability of an individual to continuously improve his or her level of knowledge to improve one's level of competence to the point of excellence. Skill is a person's ability to apply all the knowledge and skills he has to the task, as well as the responsibility to achieve a goal or objective in a better organization. Whereas personality traits are personal values and behaviors that an individual needs to experience and practice or a personnel attributes and behaviors. Competencies are divided into two (i) Generic Competencies, which are the knowledge, skills and personal characteristics and behaviors that each member of the organization should have. (ii) Functional Competencies are the knowledge, skills and personal traits that are specific to the performance of duties and

responsibilities of a job and the organization of a job. Figure 1 shows the theory of competence of Spencer (1993).

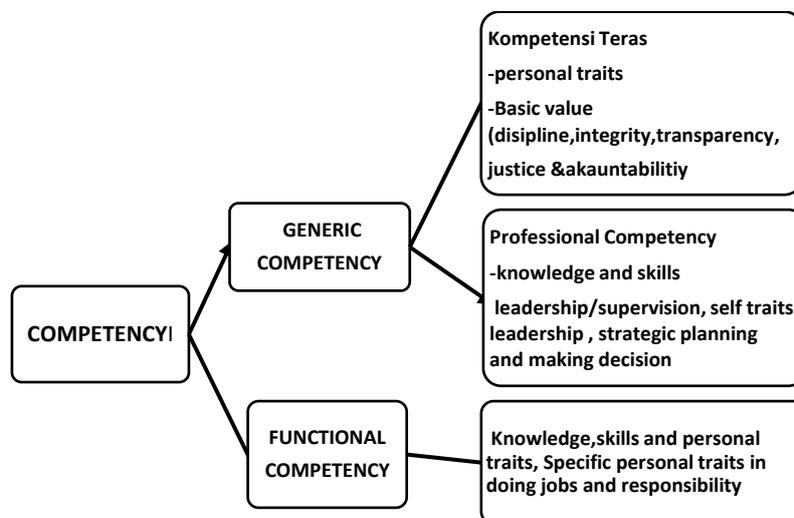


Figure 1 Competency Spencer Theory (1993)

Competence in professional management, is a generic competency that involves both core competencies as well as professional competence. In the core competencies, the components of competency involved are personalities, values, work ethic, and responsibility while professional competence involves knowledge and skills. These competencies can be observed and identified and it can be trained with courses and training workshops. Professional management competencies are competencies that can be trained, enhanced by individual TVET teachers with the support of colleagues and administrators through training, briefings or workshops.

The Needs of Management Competency for TVET's Teachers

TVET teachers need to be competent in all areas of competence. Teachers are not only focused on the knowledge and skills of pedagogy, but are fully responsible for enhancing their professionalism as well as their attitudes and personalities so that the components of their competency move in line with student achievement or competence (Lois, Khairuddin & Rosy, 2016). This is also supported by Noor, Razak and Mohamad (2018) who point out that continuous improvement in responsibility and professionalism is essential in helping teachers deal with issues and challenges in improving teacher quality to achieve a high level of achievement in the teaching and learning process. Management work is very much done by the teacher in performing the responsibilities and is a priority in assessing the performance of the teacher through each activity and program. According to Wu, Huang, Kao, Lue and Chen (2018), teacher competence can be assessed through teaching skills, classroom management skills or workshops, involvement in student counseling and referrals, student family relationships, good relationship with the administration, personal characteristics, as well as professionalism. This means that management competency is very much needed by the teacher, where the assessment of one's level of competence can be demonstrated through the way the teacher deals with matters and it can be improved through experience. Junnaina

and Hezri (2012) emphasize that experience helps teachers improve the knowledge and better presentations in the teaching and learning process

Methodology

Research Design

This study is about the process of developing teacher competence, so the selected study approach is a case study where there are issues regarding teacher competence and competency gap among TVET teachers which negatively affect teaching and learning and soft skills for TVET graduates.

The aim of the researcher in using the case study approach is to explore the interactions between informants regarding significant teacher competencies about the types of competencies and competencies available and how such competencies can be trained to master. Thus, the case study approach as suggested by Yin (2014) where the use of case studies in qualitative research is usually carried out depends on the question of how and why. The statement was also suggested earlier by Othman (2007) where case study is a qualitative research conducted in exploring, interpreting and developing in-depth understanding of a case. Further, Yin (2014) also suggests that this qualitative case study can be done if the researcher is studying a contemporary case or phenomenon rather than a historical study.

Based on the discussion of qualitative research and the case study approach, the researcher has determined that the study of TVET teacher competence building process is conducted using qualitative case study research. Researchers explore information from informants by addressing in-depth questions and enriching the findings of their research through their own teaching experience on competencies. The researcher also obtained various sources of information through interviews, observations, audio visual materials, documents and reports. Researchers use these sources of information in line with Creswell's (2013); Ahmed, Majid, & Zin, (2016) recommendation, which emphasizes that case studies require researchers to carry out detailed studies, collect in-depth data and engage multiple sources of information in research.

Informantion and Criteria

The study participants consisted of three teachers, three students and one director. The informant was determined by snowball where the first informant provided the researcher's name and informational suggestion. The selection criteria for informants consisting of teachers and directors is for more than 10 years, while student informants must consist of final year students in diploma and engineering courses and have Malaysian Skills (SKM) Levels 1 and 2. The location of this study is selected around the Klang Valley such as Sepang Vocational College, Kajang Vocational College and Sungai Buluh Vocational College. This location was chosen because it is located in an industrial area. Furthermore, selected informants also have the characteristics of being able to share information voluntarily and sincerely and to make a good commitment while having a wealth of experience. The informants involved in this study were a director with a background in education and experience in engineering, three experienced teachers in engineering and three final year students in engineering undergoing On Job Training in the industry.

Research Instrument

The study utilized a survey instrument consisting of in-depth interview data of informants from teachers, director and the final year student of diploma in faculty of engineering and further strengthened with support from participant observation from the teachers and also by doing the analysis of document such as lesson plan, port-folio files, MQA files, JPK files, student OJT files and workshop inventory files The researcher uses semi-structured interviews, based on a set of structured questions as an interview guide. The researcher addresses the questions to the informant as well as creates an atmosphere and good relationship with the informant to make the data obtained more meaningful and more quality

Research Process

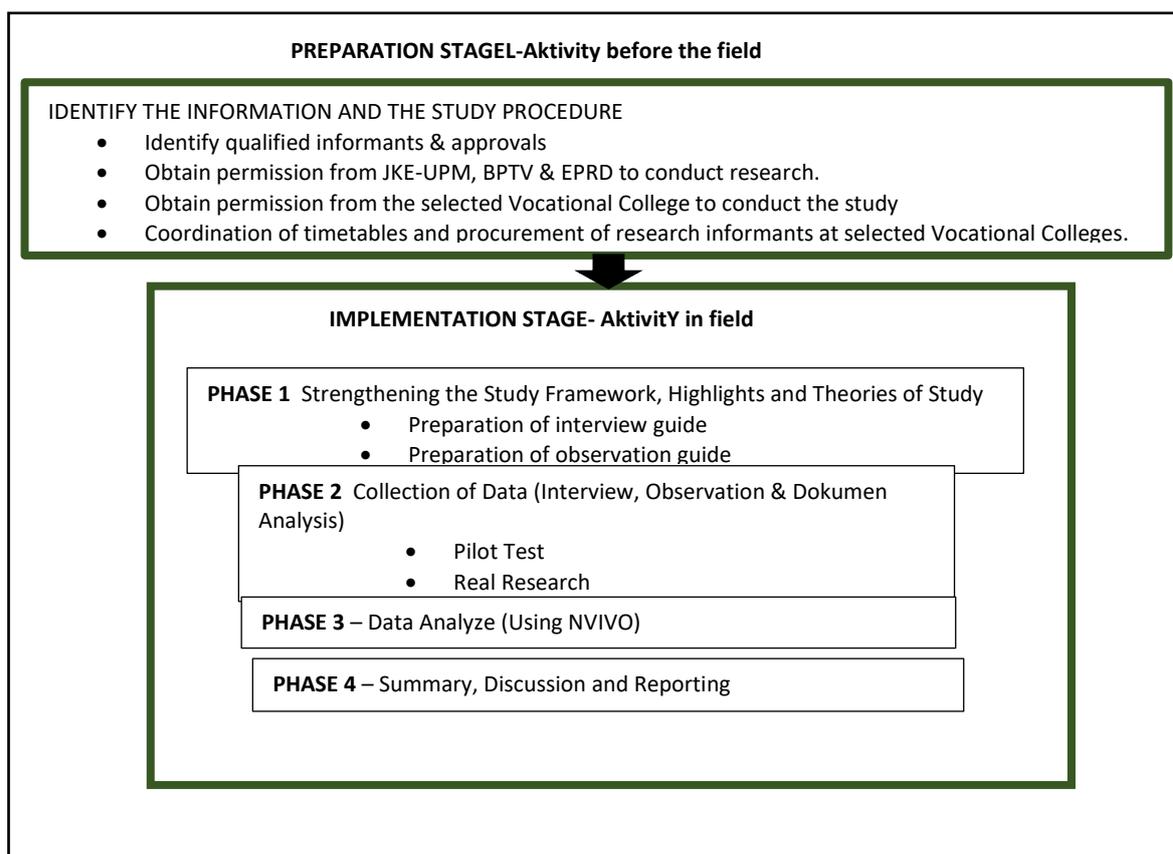


Figure 2 The Flow Chart of Research Process

Figure 2 shows the flowchart of the procedure for this study which is divided into two stages, the preparation stage and the implementation stage. The preparation stage is a pre-field activity such as identifying informants and research procedures to obtain informed consent from the relevant authorities such as JKE-UPM, BPTV and even the EPRD. Similarly, the researcher must obtain the consent of the informant by signing the research agreement. The next stage of implementation is an in-field activity consisting of four phases. Phase 1 involves the development of research frameworks and highlights and theories of research. Phase 2 involves data collection such as pilot studies and actual studies. Next is phase 3 involving data analysis and finally phase 4 involves summary and discussion and reporting

Collecting Data

In this study, semi-structured interviews were used in the data collection method. The choice of this method is because it is more balanced and appropriate in exploring participating participants (Seidman, 2013). Open-ended and probing questions are used to obtain information. Face-to-face interviewing techniques were chosen to collect data aimed at providing detailed experience and information (Rubin & Rubin, 2012). Meaningful information is generated through experience and expertise in the field that participants have been through for a long time (Seidman, 2013).

A set of interview guides was developed for the data collection phase. Interviews are routinely guided in the search for answers to the research questions in this study. This interview guide is essential for ensuring that the interview process runs smoothly and in a well-organized, well-organized way to access information in response to the research questions (Seidman, 2013). Furthermore, it is helpful to obtain regular information from the study participants.

In line with the recommendations of Merriam and Tisdell (2016); Ahmed, Khalid, Ammar, & Shah, (2017), the pilot guide was conducted in pilot-tested pilot interviews so that improvements could be made to interview questions and could be answered by informants. Pilot tests are conducted to enhance the experience and to suit the interview situation and to improve the interview questions. Then continue the actual interview by addressing the questionnaire to the informant until the research question is completed and the data reaches a saturation point.

Data Analysis

Once the data has been collected through the interview process, the researcher writes the transcript and each word item from the participants' responses was neatly written and organized without altering any words including the specific sound during the interview session. Interview transcriptions are read repeatedly to gain detailed understanding and to make the researcher fully confident and confident and to understand clearly the meaning of each transcript. The researcher then makes the meanings consistent with the actual research questions of the study. The coding process is done as soon as the transcription process is complete. Creswell and Poth (2018) state that coding proses is a process of categorizing or giving themes to something contained in a transcript or text. The coding process consists of three processes: open coding, vertical code or an axial coding and selective coding. Researchers use N-Vivo-12 software to perform data coding processes to find the meaning of keywords or phrases in answering research questions. According to Creswell (2007) there are eight strategies that can be used to enhance the validity and reliability of a study. However, in this study, the researcher used three strategies to enhance validity and reliability namely check, triangulation and by peer review.

Results

Interviews were conducted with teachers, directors and students and it was found that professional management is very much needed by TVET faculty in engineering in vocational colleges. In addition, the findings of this study are also evident in the findings of the teachers' observations as well as the findings from the document analysis.

Interviews Data

Teacher 2, Director 1 and Student 3 emphasized that professional management is essential to TVET teaching in engineering vocational college.

Teacher 2

So all teachers must be well-versed and able to handle such work. In all of these matters, teachers need to manage themselves and that is what we have been through. Even though it is fine, but it is facing it. (Int 1)

Director 1

Management is very important and must be available to our current teachers, as it is the teacher responsible for all the management and administrative work related to our vocational college assignments. Much of this management work, not only teaching, there is much to do. (Int. 1)

Student 3:

Of course teachers need skills in management work, because all things teachers need to do (Int. 1)

Collaboration Management

Director 1, Teacher 1 and Student 1 agreed that collaborative management is essential for TVET faculty in engineering vocational college.

Director 1

“In addition, the management of teachers is more involved with the employer and industry in sharing TVET information and expertise such as managing training, courses and workshops as well as managing part-time study visits as well as teacher training programs”. (Int.2)

Teacher 1

“Of course I do, because I have to manage collaborative work with the industry. So many tasks need to be done in the process”. (Int 1)

Student 1

“I admit that the teachers in this college need to do a lot of collaborative management work and I really believe in the ability of the teachers”. (Int 2)

Students Management

Teacher 1, Student 3 and Director 1 stated that TVET teachers should be skilled in managing students whether managing student about rules and discipline and also managing work for students to be more organized and secure.

Teacher 1

“Instructors must also be involved in the management of failures such as student portfolio files in which the files are composed of Continuous Assessment questions as well as Final Assessment for theory and practice by modules. These files need to be reviewed and updated regularly every semester and made reference and they are stored in the file room. So teachers need to make sure students are putting the material correctly and safely”. (Int. 2)

Student 3

“Teachers also need to be proficient in student files. Teachers need to know how to review and compile exam questions and PB and PA assessment questions in their student portfolio files and save them well in the file room”. (Int. 1)

Director 1

“Teachers should be competent or have a good skilled in student management such as discipline management, and student control, student activity management and all other student-related matters during teaching and learning and beyond teaching time”. (Int 2)

Workshop and Classroom Management

Workshop management and classes are mutually agreed upon by statements given by teacher 2, student 1 and director

Teacher 2

“Student management and classroom management must be carried out as best as possible, in terms of cleanliness, safety, student readiness, learning environment and much more. All teachers need to make sure that the teaching and learning process is smooth. Student problems, unpreparedness and more related to student attitude, all teachers need to resolve and sometimes have to deal with student parents as well”. (Int. 2)

Student 1

“Teachers need to be good at managing like managing the students, classrooms and all about teaching and learning process”. (Int 1)

Pengarah 1

“Every instructor must be competent in managing workshops and classes. In addition to maintaining the cleanliness and safety of the use of workshops and classes, and also master in layout of machines and equipment for the safe use of all students and teachers”. (Int. 2)

Teaching Preparation Management

Teachers need to be skilled in managing the work of providing teaching materials and this is acknowledged by teacher 2, student 2 and director 1

Teacher 2

“Planning and organizing student activities is important, ensuring that teachers are mentally and physically prepared, and also providing a conducive work environment and adequate work equipment must be provided. Likewise, materials such as notes and planning a good teaching and learning techniques with constantly engaging the students”. (Int. 1)

Student 2

“Teachers need to be knowledgeable, diligent and able to provide good teaching materials and master everything in the preparation of teaching materials in workshops and classes so that they are interesting and easy to understand”. (Int. 2)

Director 1

“In the process of teaching and learning, teachers are very important in managing and preparing all materials for the best use of PdP”. (Int 2)

Activity and Program Management

Director 1, teacher 1 and student 2 acknowledge that teachers need to be skilled in managing activities and programs at vocational colleges.

Director 1

“The instructor or teacher also organizes competitions such as regional, state and national skills competitions. Indirectly, it is also the duty and responsibility of the instructor to administer training and preparation for competitions and preparation of qualified students. The instructor also manages all activities and programs at vocational college including co-curricular activities. Teachers need to be versatile and very important, it is undeniable”. (Int. 2)

Teacher 1

“As there are many activities and programs that need to be implemented throughout the year, teachers need expertise in planning and managing well planned activities and programs”. (Int. 2)

Student 2:

“Yes, it is. the teacher who always manages all activities and programs from start till the end.” (Int.1)

Documentation and Reporting Management

Documentation management and reporting work are also very important and required by TVET faculty in engineering at vocational colleges as they involve a lot of filing works. This is agreed upon by teacher 1, director 1 and student 1.

Teacher 1

“Next, this KV teacher should be more skilled in management work such as managing documentation works. Document management is such as student portfolio files, OJT files, instructor port-files, MQA and JPK files, workshop equipment inventory files and so on”. (Int. 2)

Director 1

“Yes, I admit that it is a very difficult task for the teacher, in addition to carrying out the work instructions, working on the documentation and reporting as well, the teacher also has to do”. (Int. 1)

Student 1

“Yes, there is a lot of documentation work that teachers need to do, all the teachers do, the teachers are very capable and capable of doing all the work well”. (Int. 2)

Data of Direct Observation

Based on teacher observation, teachers were found to be highly committed to the task

of managing students, managing lesson preparation such as providing a complete teaching note, display materials such as screen savers, laptops and all teaching materials such as hand tools and materials while performing practical work. The instructor also manages the pedagogy well and engages the students in their teaching. The teacher is also able to manage student discipline and control the classroom in a controlled and comfortable manner before starting the class with classroom cleaning activities. The same goes for layouts in workshops related to student equipment, machines and workstations. Teachers have also shown good examples of managing work hygiene and safety in workshops and keeping in mind safety priorities during workshops.

Data of Document Analysis

Based on the analysis of documents conducted on teachers lesson plan, the portfolio of teachers, found that teachers were highly committed to the management of teaching work, the preparation of teaching materials and student management and workshop management. Further through the MQA files, JPK files, student OJT files and workshop inventory files, the researchers found that teachers were highly committed to year-round activities and programs management, documentation management and reporting. In addition, through the portfolio files of the faculty as well as the minutes of departmental meetings, teachers are also very committed to collaborative management work between vocational college and industry in planning and organizing seminars and training courses, seminars and workshops in collaboration with industry.

Discussion

Based on the data obtained through the triangulation of data from research sources such as directors, teachers and students, it clearly acknowledges and supports the need for professional management competencies such as collaboration management, student management, workshop and classroom management, teaching preparation management, activity management and programs and documentation management and reporting. All agree that professional management work is very familiar to TVET teachers in vocational colleges. Teachers need knowledge, skills and personal traits to complete doing the jobs and responsibilities such as in professional management. Spencer (1993) stated that competency is divided into two, such as generic competency that involved the core competency and the professional competency which are needed in doing jobs and responsibility and the other one is functional competency that involved knowledge, skills and personal trait.

Next, through the triangulation of the data analyzed from the interviews, the observations and the analysis of the aforementioned documents, researcher confirm that all categories of professional management are indispensable for TVET teachers of vocational colleges to be reviewed and improved over time to the present.

Proposed framework of professional management for TVET Teachers in faculty of engineering at vocational college

Table 1

Proposed Frame-work of Professional Management for TVET Teachers in Faculty of Engineering at vocational college

Theme	Category	Sub-category
Professional Management	Collaboration management	-Managing industrial visits -Manage teacher training -Manage courses and workshops
	Student management	-Managing student discipline Manage the preparation of knowledge and skills
	Workshop management and classes	-Manages the layout of equipment and machines -Manage the hygiene and safety of workshops / classes -Manage rules and disciplines in workshops / classes
	Management of teaching preparation	-Managing Teaching aids -Managing teaching materials
	Activities Management and programs	-Manage the planning of activities and programs -Manage the execution of activities and programs
	Documentation and reporting management	-Manage activity reports and programs -Managing student portfolio files -Managing instructor port-folio files -Manage student OJT files -Managing MQA / JPK files

Conclusion

Professional Management competency is very indispensable to TVET teachers in faculty of engineering at vocational colleges based on the findings from interviews from informants who agree that the elements of management competence are very synonymous with current duties as TVET teachers. This finding is further reinforced by the results of participant observation during the course. As well as the results of analysis of documents carried out on porters' portfolios, minutes of engineering department meetings and lesson plans and on-job training (OJT) files, as well as files of Malaysian Qualification and Agency (MQA) and Division of Skills Development (JPK). TVET teachers or educators should be knowledgeable and skilled, have professional qualities and characteristics and be prepared to improve and fully master every element of management competence.

Corresponding Author

Khamsiah Ismail

Faculty of Education Studies, Department of Science and Technical Education, University Putera Malaysia. 43400, UPM Serdang, Selangor, Malaysia.

Email: khmsiahikhamsiah@gmail.com

References

- Ahmed, U., Khalid, N., Ammar, A., & Shah, M. H. (2017). Assessing moderation of employee engagement on the relationship between work discretion, job clarity and business performance in the banking sector of Pakistan. *Asian Economic and Financial Review*, 7(12), 1197-121. <https://doi.org/10.18488/journal.aefr.2017.712.1197.1210>
- Ahmed, U., Majid, A. H. A., & Zin, M. M. (2016). Moderation of meaningful work on the relationship of supervisor support and coworker support with work engagement. *The Journal of Business, Economics, and Environmental Studies (JBEES)*, 6(3), 15-20.
- Anuar, K. M., Sukri, Y. K., & Norazrena, A. S. (2015). Problems in Teaching and Learning for Electrical Technology Courses at Vocational College, Faculty of *Technical and Faculty of Science Educations, Mahtematik and Multimedia Kreatif, University Teknologi Malaysia*.
- Bauer, W. (2007). International Perspective on Teacher and Lecturer in TVE. University Bremen-ITB Buletin.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). thousand Oaks, CA: Sage Publication.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications Ins.
- Creswell, J. W., & Poth, C. (2018). *Qualitative inquiry and research design: Choosing among five Approaches. International student edition*. (4th edition). Thousand Oaks, California: SAGE.
- Golliong, L. M., Khairuddin., & Talin, R. (2016). Competency of Personel, Pedagogy, Professionalism of West and North East of Sabah Primary School *Jurnal of Nusantara Education*, Special Edition, University Teknologi Malaysia and Universiti Muhammadiyah Makassar.
- Hayati, N. R., Zuraidah, A., & Sufean, H. (2017). General Competency Level for Lecturer in Construction Technology, Civil Engineering at Vocational College, Ministry of Education Malaysia Based on Grades and Years of Teaching Experience. *Jurnal of Educational leadership Bil. 4. Issue 4*.
- Jamaliah.(2014). *Kesediaan Guru Kolej Vokasional Dalam Pengajaran Amali Teknologi Elektronik Di Negeri Pahang*. Dissertasion of Degree Masters. Universiti Tun Hussein Onn, Malaysia.
- Junnaina H., C., & Hazri, J. (2012).The Effect of Field Specialization Variation on Technological Pedagogical Content Knowledge (TPACK) Among Malaysia TVET Instructors. *The Malaysian Online Journal of Educational Technology (MOJET)*. Volume 2, Issue 1
- Kayan, L. C., Hamzah, R., & Udin, A. (2010). The Transformation of Technical and Vocational Education: Building the Future Leaders. *Journal Edupress*, 8.
- Kementerian Pelajaran Malaysia. (2013). *Malaysia Education Development Plan 2013-2025*. Ministry of Education Malaysia.
- Lebar, O. (2007). *Penyelidikan Kualitatif: Pengenalan kepada teori dan metod*.Tanjong Malim, Selangor: Publishert Universitiy Pendidikan Sultan Idris.
- Mahazani. (2011). *Development of a New Empirical Based Competency Profile for Malaysian Vocational Education and Training Instructors*. Polytechnic, Ministry of Higher Education Malaysia.

- Merriam, S. B., & Tisdell. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.
- Mustafa, N. (2013). Professional Competency Differences among High School Teachers in Indonesia. *International Education Studies*; 6(9).
- Rosmawati, N., Razak, A. & Mahzan, M. (2018). Professionalism Practise Among Lecturers in Polytechnic in Malaysia. *International Journal of Academic Research in Business & Social Sciences*. Volume 8, No. 2, E-ISSN: 2222-6990.
- Rubin, H. J., & Rubin, I. S. (2012). *Qualitative Interviewing: The Art of Hearing Data* (3rd edition). Thousand Oaks, California: SAGE.
- Seidman, I. (2013). *Interviewing as Qualitative Research: A Guide for Researchers in Education & Social Sciences* (4th edition). Amsterdam Avenue, New York: Teachers College Press.
- Siraj, S., & Ibrahim, M. S. (2013). Malaysian Teacher Competency Standards. Proceedings of the National Seminar *MAJLIS DEKAN PENDIDIKAN IPTA 2012*. Johor: University Teknologi Malaysia
- Spencer, L. M. and Spencer, S. M. (1993). *Competence at Work*. New York: John Wiley & Sons.
- Technical and Vocational Education Division (BPTV, 2012). Introduction of PTV Transformation. Accessed on Nov 20, 2017, from <http://www.bptv.edu.my/v3/index.php/transformasi-pendidikan-vokasional>
- Wu, M. J., Huang, C. Y., Kao, Y. S., Lue, Y. F., & Chen, L. C. (2018). Developing a Professional Performance Evaluation System for Pre-Service Automobile repair Vocational high School Teachers in Taiwan. *Sustainability MDPI*, 10, 3537; doi: 10.3390/su10103537
- Yin, R. K. (2014). *Case study research: design and methods* (5th ed.). Thousand Oaks, CA: Sage Publications Ins.