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Investigating the level of generic skills and the level of job performance among STEM teachers in Malaysia: A study to improve the quality of STEM teachers

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Abstract

In today's world, education is the most important element one needs to be able to meet with challenges that come with globalization. To be able to cope with the challenges, it is an essential that learners are equipped with several skills such as generic skills so that these skills would help them in their working environment. Unfortunately, the use of generic skills is lacking among Malaysian teachers which is resulting in low quality of teaching activities. As such, this study intends to investigate the level of generic skills and self-efficacy of STEM teachers in secondary schools in Malaysia and to look at their level of performance in schools. The correlational study adopted a quantitative approach. The empirical data of 382 teachers were analyzed using the Smart Partial Least Squares. The findings show that there is a high level of generic skills and level of job performance among STEM teachers in Malaysia. This study increases the treasures of knowledge in the educational environment and other fields such as social sciences, methodology and psychology. The findings indicate an effort towards finding ways to improve contextual performance among STEM teachers, through high generic skills. Although the findings of this study have led to the proving that self-efficacy fails to act as a mediator, research is still required from other researchers in the future through the position of other variables.

Keywords: Generic skills, STEM, self-efficacy, SMART-PLS

Introduction

Education is an effort to produce people who are knowledgeable, have a good personality and high human capital, own sense of belonging, responsible, can communicate and accept challenges (Amiruddin et al., 2015). The challenges of globalization and the national economy require Malaysians to be more knowledgeable, more skilled, more disciplined, prioritize quality, and open-minded. The development of highly skilled human capital is very important in contributing to the development of a country (Othman et al., 2008). Generic skills must be present in an individual to make it an excellent human capital based on knowledge, increase productivity and competitive attitude (Amiruddin et al., 2015).

Generic skills include aspects of skills that involve cognitive elements related to non-academic skills such as leadership, group work, communication and problem solving (Noor et al., 2019). Generic skills are elements that are identified as bringing needs and wants in the world of work (Othman et al., 2008). These skills not only emphasize that an individual needs to meet the skills needs in facing the challenges of the world of work but it is an important element that needs to be applied to an individual (Wong et al., 2017). This is because, the current job market needs those who need productive and knowledgeable workers in addition to having skills in the academic field. Small et al. (2004) argued that a teacher needs to have positive characteristics and attitudes, emotional intelligence, creative ability, ability to solve problems, can work in groups and be able to adapt. Generic skills are an important element in fulfilling human resources that are competent in global needs as well as meeting the goals of the

National Education Philosophy which is a balanced human capital in terms of physical, spiritual and intellectual (U. R. Chen et al., 2014), the need for generic skills is very important in producing students in Malaysia who have the required needs to make students who have marketability. Generic skills that are to be applied should be relevant, useful and durable and can strengthen the education system to be able to be the basis for lifelong learning support (Nordin & Tahir, 2004). According to them, generic skills should be beneficial and essential for teachers to venture into all career fields and meet the needs of current employers. These generic skills are something realistic and important to develop and assess. These skills are very much needed by all sectors to make students and teachers more effective and efficient (Ariffin et al., 2010).

Generic skills in the academic world were first introduced by Mayer and Salovey in 1990 emphasizing interpersonal and intrapersonal characteristics as suggested by Gardner (1978). Ross et al. (2002) emphasized the importance of developing generic skills to help students cope with a variety of high-risk behaviors. To achieve this goal students have been guided on how to make meaningful decisions, understand their own feelings and those of others, listen clearly, communicate effectively and respect the differences that exist between them. The results of the study also found that individuals' ability to understand and manage emotions can improve their work performance (Ashforth & Humphrey, 1995). This view is supported by (Goleman, 1999) because generic skills are also associated with improved job performance. Bar-On (2014) explained that individual generic skills possess strengths and skills that can influence the ability to master the environment which can affect psychological well-being and increase individual productivity. Therefore, generic skills are very important for educators because it can increase the attention of students to improve memory and through a more meaningful learning process in the classroom (Preeti, 2013).

Mayer and Geher (1996) in their study claimed that individuals who have emotional relationships will better understand the emotional implications in their thinking and easily solve each problem. This purpose would be more meaningful if individuals with generic skills could understand and express social characteristics while performing their duties or responsibilities in life effectively (Zins & Elias, 2007). Thus a teacher who has high generic skills is more able to solve students' problems because in him has the nature of empathy and good social skills (Goleman, 1999). A study in Jordan Mahbob and Ibrahim (2017) clearly identified that children will not be able to achieve their learning goals fully if they are not nurtured with love and empathy. As an effort to improve the education system in Malaysia, the government of Malaysia stipulated in the 10th Malaysia Plan put emphasis for educational development on physical development and also on aspects that have a big impact on student performance such as teachers' skills and competencies to be able to sit as low and stand as high as developed countries (Malaysian Prime Minister's Office, 2010). These programs are done because although many efforts have been made before but only 115 schools or 1.51% of schools out of 7,618 have reached the level of high performance schools which is Band 1, while there are 209 or 2.75% schools that are still in low performance level which is Band 6 and 7 (Malaysian Prime Minister's Office, 2010). Table 1 below shows the performance range of the primary schools in Malaysia.

Table 1. Number of primary schools in Malaysia in the performance range (Source: KPM, 2013)

No	Performance Range set based on composite scores	Number of primary schools	Percentages (%)
1	>85	115	1.51
2	75-84	1495	19.62
3	65-74	3465	45.48

4	55-64	1825	23.96
5	45-54	509	6.68
6	35-44	163	2.14
7	<35	46	0.61
	Total	7618	100

Teachers have a great responsibility for successful student achievement in the classroom (Maulana et al., 2015). To fulfill these responsibilities, teachers must always be ready to equip themselves with various skills and competencies such as improving teaching methods, mastering the necessary technology, building a harmonious atmosphere, and forming a friendly relationship between teachers and students during the learning process (Syafrimen, 2010). To succeed, teachers must have self-confidence (H. Chen et al., 2017) as it can help teachers and students to create learning objectives. For that, teachers need to motivate and stimulate students' interest in learning. This is utmost important so that students can be motivated to continue to develop their knowledge independently and actively involved in the learning process in the classroom (Gambari & Yusuf, 2015). In line with Karacop (2016), student involvement in learning can improve student achievement, develop an appropriate learning environment, and maximize student achievement. Thus, the skills and competencies possessed by teachers can lead to the effective delivery of learning and ultimately can maximize student achievement. STEM is a teaching approach that integrates four disciplines simultaneously, namely science, technology, engineering, and mathematics. On the other hand, STEM is an important element in the 21st century science skills (Nuangchalerm, 2017). STEM learning in schools must be taught in an integrated manner (Bybee, 2010) because STEM is:

a) scientific, technological, engineering, and mathematical knowledge, b) forms of human endeavor, c) material, intellectual, and cultural world forms, and d) STEM as a sentimental and contributing people's thinking in education.

Quality learning process is of course also closely related to the quality of teachers (Nur Amelia Adam & Lilia Halim, 2019). Therefore, serious attention should be given to the quality of teachers and the quality of prospective teachers in STEM (McIntyre et al., 2021). If the quality of teachers in integrating STEM can be successful, then the teaching and learning done will run more effectively and meaningfully. The National Research Council (2003) emphasizes that undergraduate education should be responsible for training future leaders within the scope of STEM teaching and learning. In NRC (2003), 5 characteristics can be articulated to higher learning institutions that are effective in teaching and learning STEM, namely having knowledge of high teaching materials, using skills, experience, and creativity of pedagogy and technology accurately, interacting professionally with students in in and out of the classroom, as well as constructively involving other professions to enhance classroom teaching.

According to Gibson and Dembo (1984) in order to understand the effectiveness of a teacher in more depth, several factors such as education and socialization of teachers and school organization must be studied. Ashton (1984) states that teacher effectiveness can and should be built because teachers desperately need skills to be used in self-concept so that their teaching becomes more effective. Therefore, Gideonse (1984) contended that if teacher effectiveness is needed, teacher training should be conducted in a long time and in many places. This is because the school situation is not the same with each other. In terms of organizational factors, Ashton (1984) stated that some factors found in the organization will cause teachers to increase their effectiveness. These factors are (i) teacher recognition and support. (ii) teachers place high expectations on their teachers. (iii) teachers provide opportunities for their teachers to be involved in the decision-making process. As the Ministry of Education Malaysia (MOE) has begun to show interest in the Integrated STEM approach for the school level, then the curriculum should have clear features of Integrated STEM. What are the desired features? The question of the

characteristics of integrated STEM should refer to the definition of Integrated STEM formulated by researchers in this field as explained by Bryan et al. (2016). The features presented by the researchers are ideally good, but the main issue is at the implementation stage of the new curriculum later. In the context of the United States, the implementation of Integrated STEM is also a major issue due to the existence of concrete constraints. Among the main constraints are professional training for teachers, prospective teachers, and policy implementers. Science and Mathematics teachers in the United States have less exposure to knowledge related to the field of Engineering (Roehrig et al., 2012).

However, the results of the OECD Programme for International Student Assessment (PISA) which is an international test undertaken by 65 countries for the years 2009 and 2012, show that the level of Malaysian students' achievement is still low compared to neighboring countries, namely Singapore, Vietnam and Thailand (Ministry of Education Malaysia, 2013). The results of PISA in 2009 and 2012 show that the achievement of Malaysian students has increased in Mathematics but decreased in Reading and Science. The reading score for 2009 was 414 points, while the score for 2012 was 398 points with a ranking of 55 and 59. respectively. The mathematics score in 2009 was 404 points, while the score in 2012 was 421 points, with a ranking 57 and 52. The science score in 2009 was 422 points, while the score in 2012 was 420 with positions at 52 and 53. All these scores are below the 2012 OECD average score.

In addition to the results of PISA 2009 and 2012, the Ministry of Education (2014; 2015) also reported that the level of literacy achievement in Malay, English and Mathematics in primary schools has yet to achieve the targets set. For Bahasa Malaysia Literacy 2013, the target achievement for Year 1 students is 90%, but the achievement obtained is 81.3% (Ministry of Education Malaysia, 2014), while the achievement for 2014 is 80.3% (Ministry of Education Malaysia, 2015). For English Literacy, the target in 2013 for Year 1 is 67%, while the actual achievement is 63.3% (Ministry of Education Malaysia, 2014). For Mathematics 2013, the target is 90%, while the achievement is 90.1% (Ministry of Education Malaysia, 2014), but the achievement in 2014 dropped to 87.0% (Ministry of Education Malaysia, 2015). Among the causes of problems identified is the level of self-efficacy of Malaysian teachers which was at a low level (OECD, 2009). In addition, although organizational performance is important because it can produce organizational staff who like to help and assist, but the level of organizational performance among teachers in Malaysia is still low (Yasin Munir, Saif-Ur-Rehman Khan, Zainab Khalifah, Tahira Asif & Hashim Khan, 2014). Since the government's goal is to produce quality teachers through a systematic approach to improve the quality of new teachers as well as the quality and professionalism of existing teachers, there is certainly no right answer and method to achieve this goal. Therefore, by knowing the level of generic skills and the level of job performance among STEM teachers, the quality of STEM teachers required by the government by producing high-performing teachers will be known more clearly. Thus, the issue to produce quality and high-performing teachers is used to answer research questions in this study.

As such, the research questions that guide this research are:

i) What is the level of generic skills and self-efficacy of STEM teachers in secondary schools in Malaysia?
ii) What is the level of performance of STEM teachers in secondary schools in Malaysia?
iii) Is there a relationship between generic skills and teacher effectiveness and STEM teacher performance in secondary schools in Malaysia?

In terms of knowledge, this study contributes to the addition of value in performance research by giving emphasis and attention to research efforts to improve the work performance of teachers in Malaysia. This study is based on Social Exchange Theory that has been developed by psychologists such as John Thibaut and Harlod Kelley, sociologists such as George Homans, Richard Emerson, and Blau, 1967. Based on this theory, individuals have entered into exchange

relationships with other individuals because of that individual can earn a reward. In other words, an exchange relationship with another individual will result in a reward or benefit. Thus, the theory of social exchange sees between behaviors in a reciprocal environment. In general, social relationships consist of society, so individuals and other societies are seen to have a mutually influential behavior in the relationship, which there are elements of reward (reward), sacrifice (cost) and profit (profit). Reward is all that is gained through sacrifice, while sacrifice is all that is avoided, and profit is the reward reduced by sacrifice. Thus, social behavior consists on the basis of the exchange of at least two individuals based on profit-loss calculations, such as patterns of workplace behavior, romance, marriage, and friendship.

Social Exchange Theory suggests that social habits are the result of an exchange process. The purpose of this exchange is to maximize the benefits and minimize the costs involved. According to this theory, individuals consider the potential benefits and risks for social relationships. When the risk is heavier to reward, the individual will terminate or leave the relationship. This theory of social exchange is also used to explain various studies of attitudes and behaviors in the economy (Theory of Economic Behavior). In addition, this theory is also used in communication research, for example in the context of interpersonal communication, groups and organizations. In addition, social exchange theory explains attitudes in economics as well as relationships in the context of communication.

MethodsThis study is a quantitative study. This is because there is little information that explains the phenomenon of the study. Thus, through this quantitative study, it can help researchers form a study model that can explain the phenomenon or issue of the study (Cavana et al., 2001). The approach of this study is also in the form of correlational study (correlational study) because correlation can explain the relationship between variables simultaneously. Next, the unit of analysis of this study is individual and the study is conducted cross-sectional. According to Creswell (2008), a descriptive study conducts cross-sectional study is suitable to test the attitudes, beliefs, opinions and behaviors of individuals. In addition, this cross-sectional study can also be used to compare the attitudes, beliefs, opinions and behaviors of various groups of respondents. Therefore, this survey research method that uses cross-sectional design is suitable for use because it is comprehensive and can be used to express various types of questions, such as issues related to teaching and learning problems, teacher effectiveness, generic skills and teacher performance.

While Hair et al. (2014) said that quantitative data analysis can measure respondents' reactions and responses to the questionnaire and can analyze the problems studied briefly and accurately. This is because quantitative data is systematic, standard, easily analyzed and presented in a short time. The unit of analysis in this study is individuals who are teachers who teach in secondary schools consisting of STEM teachers. According to data from the Ministry of Education Malaysia (2016) there are a total of 2408 secondary schools throughout Malaysia with a total of 181,978 teachers. Thus, the study population is STEM teachers who are teaching throughout secondary school. The sample size was set at 500 respondents (a total of 40 teachers were taken as study respondents from each area visited) which exceeds the maximum sample size for a population of more than 75,000 respondents (Cavana et al., 2001) which is 382 respondents. This larger size is needed to overcome the problem of possible respondents not answering the questionnaire completely and to overcome the problem if the response from the respondents to answer the questionnaire is not encouraging. This size also fits the suggestion of a rough tip by Roscoe (in Cavana et al., 2001) which stipulates that sample characteristics should exceed 30 but less than 500 for most studies. This sample size also exceeds the recommendation by Hair et al. (2014) who set a sample between 100-200 is adequate for the purpose of analysis using the Structural Equation Model (SEM) method. Since the study sample represents the entire STEM teachers in secondary schools across the country, the determination of the study sample is very critical.

In this study, the probability sampling framework was selected to represent the sample. The purpose of the study is to generalize. Therefore, the simple random sampling method is the most suitable method. In addition, simple random sampling methods can ensure that all elements in the population can be considered and have the same opportunity to be selected as study respondents. Thus, the scope of use of the findings of this study is wide (Cavana et al., 2001).

The research instrument is a questionnaire. There are four parts in forming a study questionnaire. The relevant sections include: (A) Respondent background, (B) Teacher Generic Skills, (C) Teacher Self-Efficacy, and (D) Teacher Performance. All instruments of the study variables are in the form of constructs or indices, except the background of the respondents. All of the statements in the questionnaire is in English and Malay, this is because respondents consisted of teachers of various races and is predicted that the respondents do not have a problem to understand both languages and thus it gives a proper response to the questions contained in the questionnaire. In this study, a pilot study was conducted on 50 teachers in schools around Kubang pasu. Data transmission and collection is done by "Drop and Collect". Respondents evaluated the questionnaire given in terms of sentence structure and their understanding of the questions asked. They also marked mistakes and questions that were difficult to understand for researchers to correct. The pilot test results are shown in Table 3.2. It was found that Cronbach's Alpha values ranged from 7.12 to 8.81, exceeding the requirements as stated by Hair et al. (2014).

Data were analyzed using the Statistical Package of Social Science (SPSS) Program and Smart-PLS software. First the data was entered into the computer. Questionnaires were analyzed using inferential and descriptive statistics. From the data obtained, the results of the study were discussed according to each item based on the objectives and questions of the study.
Descriptive analysis is an analysis conducted to explain the nature of a data. For example, the distribution of respondents and the calculation of the average score of each question asked. The statistical calculations involved are frequency, percentage, mean and standard deviation. Descriptive tests were used to determine the level of interest and views of respondents for each measurement or variable. For this purpose, researchers have calculated the average answer score or value and used the midpoint to divide the level of view of respondents into low, medium and high (Healey, 2005). The mean scores are categorized as follows:
a. Low = 1.00 to 2.25
b. Medium = 2.26 to 3.75
c. Height = 3.76 to 5.00

In this descriptive test as well, the values of skewness and cortusis coefficients were also removed to prove the normal distribution of data. According to Healey (2005) also, the coefficients of skewness and kurtosis that indicate the normal distribution of a data are below +2.00 and -2.00.
Inference analysis is a more in-depth statistical analysis to test the relationship and effect of one variable to another variable. In this study, two types of inference analysis involved were Pearson correlation and multiple regression test.

The analytical techniques applied in this study involve several stages. The first stage involves the process of data filtering and testing to meet the multivariate assumptions. The purpose was to see the position and appropriateness of the data for the purpose of statistical analysis (Tabachnick & Fidell, 2007). After passing the first stage, the analysis data in the second stage was the analysis of exploratory factors to identify the underlying structure of the study variables. In the third stage, structural equation modeling (SEM) for analyzing related constructs was implemented. According to Byrne (2010), the use of this approach has several advantages such as being able to test the measurement model (measurement model) and structural model (structure model) of study simultaneously. Measurement models were performed through validation of factor analysis to validate the measurement scale for a construct. Variables that passed this analysis were applied in the analysis of structured models to study the relationship between endogenous variables and exogenous variables in this study.

Findings

Out of 400 questionnaires distributed, 382 were returned and equal to 95.25 percent of returned rate. Table 2 summarizes the distribution of the respondents. 44.09% were male STEM teachers. More than 50% were aged between 30 to 49 years old and were Malay teachers. Most of respondents were also Bachelor degree holders (57.7%).

Table 2: Demographic background of the respondents

	Frequency	Percentage
Gender		
Male	168	44.09
Female	213	55.91
Ethnic		
Malay	213	55.9
Chinese	67	17.6
Indian	59	15.5
Others	42	11.0
Age		
Below 30	67	17.59
30 to 49	198	51.97
50 to 60	104	27.30
More than 60	12	3.15
Qualification		
Diploma	40	10.5
Bachelor Degree	220	57.7
Master's Degree	89	23.4
PhD	32	8.4
Experience		
Less than 10	71	18.64
10 to 19	184	48.29
20 to 30	115	30.18
more than 30	11	2.89

Assessment of a Measurement Model

To assess the measurement model, the following activities were undertaken in this study: examining internal consistency reliability, ascertaining indicator reliability and determining convergent and discriminant validity (Hair et al., 2014). These activities were undertaken in order to identify the relationship between the observed variables and the underlying latent constructs (Abdul Hamid et al., 2015).

The first stage hierarchical construct model was first assessed as seen in Tables 2, Table 3 and Figure 1.

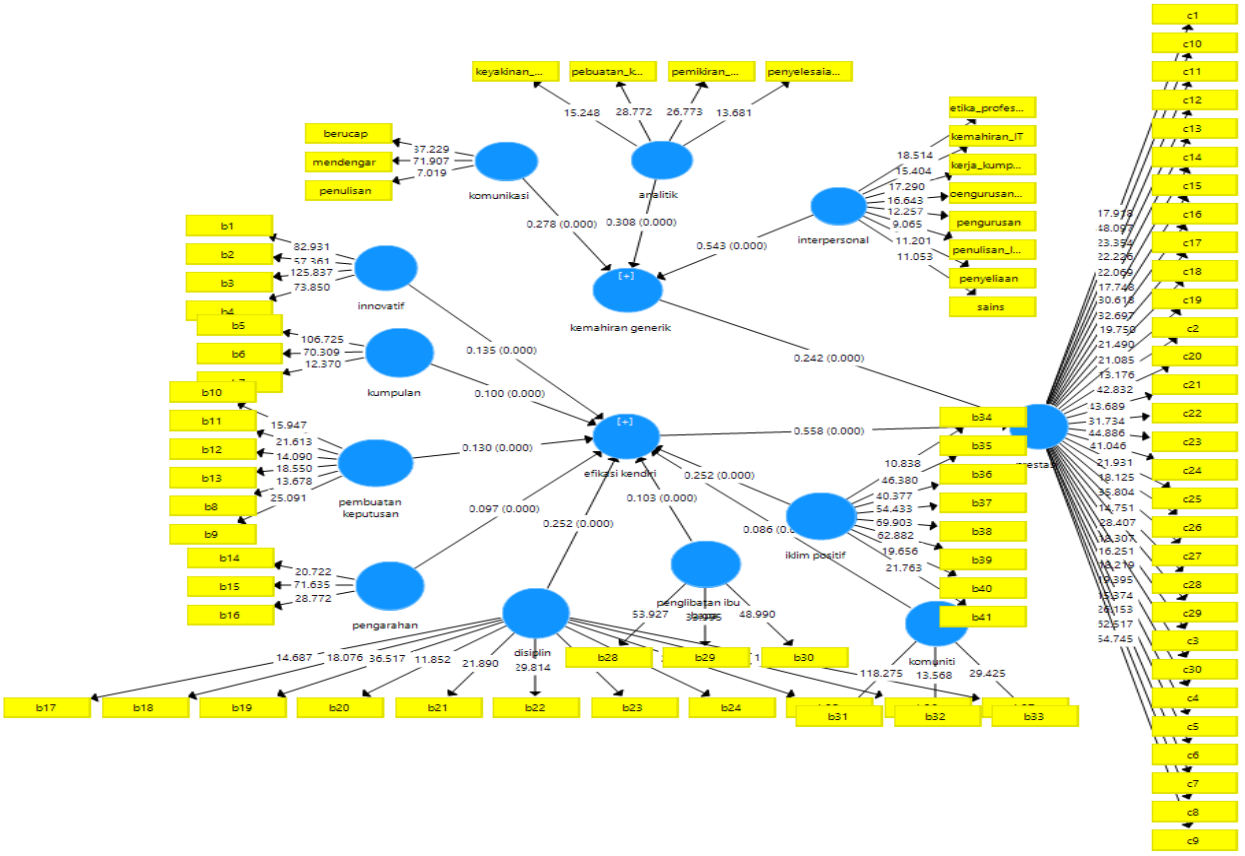


Figure 1: Algorithm of First-Stage Hierarchical Construct Model

The Cronbach's alpha coefficient and composite reliability coefficient were used to measure the internal consistency reliability for this study. Using composite reliability coefficient to interpret internal consistency reliability is based on the rule of thumb that composite reliability coefficient should be at least 0.70 (Hair et al., 2014). Thus, as can be seen in Table 2, the Cronbach's Alpha values are between .880 and .969, while values of composite reliability are between 0.715 and 0.920. Thus, internal consistency reliability is not an issue for this study.

The indicator reliability was assessed by examining the outer loadings of each constructs' measure (Hair et al., 2012). To ensure unidimensionality of a measurement model, items should be 0.50 or higher (Asyraf & Afthanorhan, 2013). Since most of the items in Figure 1 have relatively good loadings, 0.60 was taken as the minimum for the first stage model of this study; hence, all indicators with factor loadings greater than 0.60 were retained in the model.

Convergent validity is the extent to which items truly represent the intended latent construct and correlate with other measures of the same latent construct (Hair et al., 2006). The convergent validity of this study was examined by the AVE of each latent construct, as suggested by Fornell and Larcker (1981). The AVE of each latent construct should be at least 0.50 (Chin, 1998). The AVEs for this study as shown in Table 3 are all above 0.50, suggesting adequate convergent validity.

Table 3: Reflective Measurement Model

	Convergent Validity		Internal Consistency Reliability	
	Indicator Reliability	AVE	Cronbach's Alpha	Composite Reliability
Generic skills	0.928	0.529		
Communication	0.764	0.564	0.780	0.785
Analytic	0.836	0.576	0.720	0.781
Interpersonal	0.734	0.548	0.729	0.734
Self-efficacy	0.971	0.546	0.967	0.970
Discipline	0.900	0.583	0.892	0.910
Parents	0.787	0.694	0.781	0.872
Climate	0.928	0.650	0.920	0.936
Innovative	0.944	0.853	0.943	0.959
Community	0.711	0.664	0.736	0.853
Decision making	0.764	0.554	0.758	0.832
Group	0.844	0.705	0.779	0.874
Direction	0.747	0.632	0.712	0.837
Job performance	0.967	0.591	0.963	0.966

Similar to convergent validity, AVE was also used to determine the discriminant validity of this study. Accordingly, based on Fornell and Larcker (1981), discriminant validity was evaluated with the use of the AVE with a score of 0.50 or more. Also the square root of the AVE should be greater. Thus, as seen in Table 4, the values of AVE for this study are between 0.529 and 0.853, indicating acceptable values. In Table 4, the correlations among the latent constructs are compared with the square root of AVE (in bold face). The AVEs are all greater than the correlations among latent constructs, indicating sufficient discriminant validity.

Table 4: Fornell-Larcker Criteria

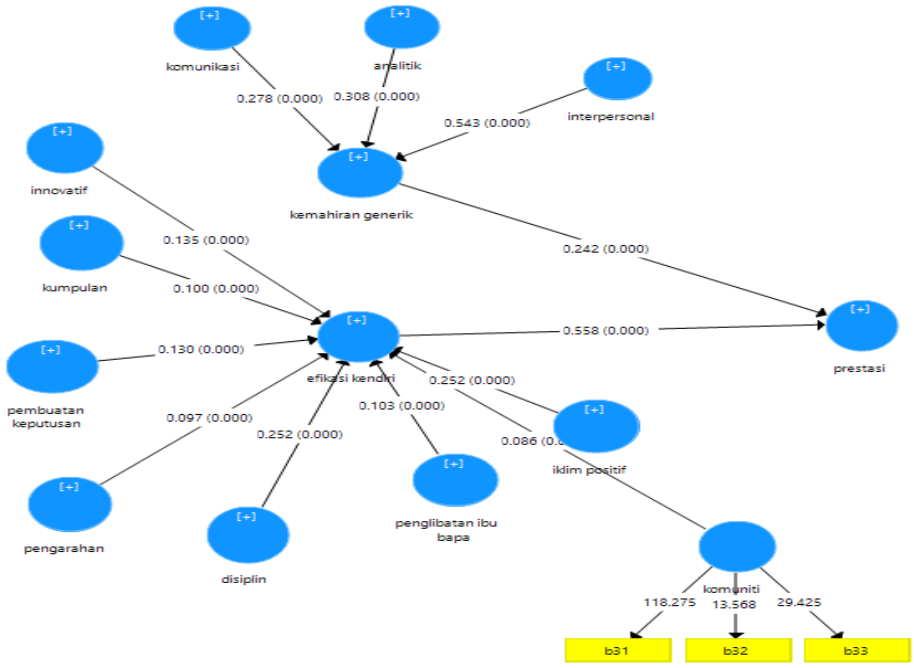
	Analytic	Discipline	Positive climate	Innovative	Interpersonal	Communication	Community	Grouping	Decision making	Direction	Parental involvement	Performance
Analytic	0.790											
Discipline	0.177	0.895										
Positive climate	0.145	0.627	0.806									
Innovative	0.055	0.538	0.717	0.924								
Interpersonal	0.706	0.200	0.221	0.112	0.859							
Communication	0.438	0.116	0.153	0.058	0.735	0.751						
Community	0.166	0.539	0.705	0.656	0.224	0.150	0.815					
Grouping	0.109	0.737	0.714	0.694	0.205	0.152	0.595	0.840				
Decision making	0.187	0.872	0.634	0.558	0.213	0.118	0.541	0.742	0.773			
Direction	0.144	0.777	0.723	0.753	0.239	0.173	0.638	0.829	0.762	0.795		
Parental involvement	0.164	0.680	0.87	0.686	0.252	0.181	0.805	0.801	0.699	0.747	0.833	
Performance	0.294	0.588	0.547	0.368	0.357	0.290	0.472	0.508	0.569	0.529	0.563	0.700

Assessment of Significance of the Structural Model

The current study assessed the structural model. This study also applied bootstrapping method with 5000 bootstrap samples to assess the significance of the path coefficients (Asyraf & Afthanorhan, 2013; Hair et al., 2014). Figure 2 and Table 5 therefore show the estimates for the full structural model. As presented in the above Table 4, the research model explains 62.0 percent of the total variance in employee commitment. This advocates that the sets of exogenous latent variables (i.e., organizational factors) collectively explain 62.0 percent of the variance of the employee commitment. Therefore, resulting from Falk and Miller (1992) and Chin (1998) the criteria, the endogenous latent variables showed acceptable levels of R-squared values, which were considered as substantial respectively.

Table 5: Variance Explained in the Endogenous Latent Variables

Latent Variables	Variance Explained (R2)	Adjusted R2
Teachers' job performance	0.431	0.428



Hypotheses Testing

At the beginning, Hypothesis 1 to Hypothesis 2 predicted that generic skills have a positive relationship with performance. Result in Table 7 and Figure 2 revealed a significant positive relationship between generic skills (B = 0.242, t = 5.993, p< 0.01), supporting Hypothesis H1. Similarly, Hypothesis 2 anticipated that effectiveness is positively associated to performance. As shown in Table 7 and Figure 2, result also show significant association between effectiveness and performance (B=0.558, t = 14.724, p < 0.05), also support Hypothesis 2.

Table 7: Structural Model Assessment

Hypothesis	Relationship	Beta	T	Sig.	Summary

H1	Generic skills -> Teacher's work performance	0.242	5.993	0.000	Supported
H2	Self-efficacy -> Teacher's work performance	0.558	14.724	0.000	Supported

Discussion

STEM teachers show generic skills from an interpersonal skill standpoint which are more important than communication and analytics skills. Generic skills are an important element in meeting human resources that are competitive in global needs and meet the goals of the National Education Philosophy of human capital that is physically, spiritually and intellectually balanced. Therefore, generic skill requirements for teachers especially STEM teachers are very important in producing students in Malaysia who have the necessary requirements to produce students with marketability. This may be due to the high awareness of interpersonal skills which are well driven by strong self-motivation in STEM teachers. STEM teachers have strong self-confidence and this will help them realize the importance of interpersonal skills. Zakaria (2005) explained that if a person believes that he can do a difficult task, then he can actually do it. This is because once confidence is built, it will increase one's self-strength in the face of challenges.

STEM teachers' awareness of the importance of communication skills will help teachers to better compete in jobs. With this high level of teacher awareness, this will enable them to achieve the highest level of achievement as they have the will to learn ways to encourage themselves to be more successful. STEM teachers' awareness of the importance of analytics such as critical thinking and problem-solving skills also showed moderate levels. This shows that teachers recognize the importance of thinking critically in solving problems especially in performing their duties as a teacher. This is critical in the tide of modernization and technological development that brings various challenges that require an efficient, resilient and thinking manpower. This is parallel in a study by Heong et al. (2012) who proctored the workforce should be equipped with thinking and learning skills that would enable them to learn new technologies easily and in a short period of time.

Self-efficacy is an individual's belief in himself and his ability to successfully manifest certain behaviors (Bandura, 1986). This belief also includes the challenges that lie to be faced, how much effort has been tried for this behaviour and how long it will take to deal with and overcome the problems that arise (Bandura, 1993). Individuals with a high level of self-efficacy will be more confident of succeeding in completing a performance domain. Teaching ability which means the belief that a teacher can change his pupils, is limited due to the influence of external factors such as the environment, background with parental influence. High-efficiency teachers are constantly planning to keep their students learning, setting goals, and identifying strategies to achieve them, whereas low-efficiency teachers do not strive to set goals that their students should achieve and are unsure what their students should achieve. The low-cost teachers also do not devise strategies to facilitate the achievement of goals.

Next, high-efficiency teachers enjoyed their job as a teacher and also when they were with their students. On the other hand, low-cost teachers are often frustrated with their duties as teachers as well as having negative feelings about work as well as towards their pupils. This is in line with Shaukat et al., (2019) who explained that high-efficiency teachers felt that they were capable of transforming their pupils from unsuccessful to successful. Teachers in this category place a strong emphasis on academia, can be with poor and troubled pupils over a longer period of time and constantly review the work of pupils. The study also explained that there is a positive association between teacher efficiency and teaching behaviors such as delivery, questioning and classroom management strategies.

Each individual has a self-system and skills that allow them to implement control measures over their thoughts, feelings, motivations and actions. These skills provide reflection mechanisms and sets of subfute to deal with, organize and evaluate behavior when reacting to the environment. For example, interpretation of past achievements stimulates an individual's self-system to provide information to influence cognitive processes and actions. This process affects self-belief, and performs actions that are deemed and trusted to suit the needs of the environment. The findings are also in line with a study by Borhan et al., (2019)w hich reported a significant influence on generic skills on behavior. Other studies supporting the findings of the study was a study by Swafford and Anderson (2020) which revealed that, overall, respondents were at a better level of generic skills when it came to class management than other teacher efficiency constructs.

As stated by Vandenberghe et al. (2019) in their classical theories, the achievement and effectiveness of the organization is determined by not only the productivity of the employees but rather on their willingness and willingness to perform something more than specified in their work specifications or task list. Findings from Ostroff (1992) can be used as a comparative basis to the study conducted due to similar types of sampling and background of the study, which is among teachers who teach in high school. As such, the job level factor and the type of organization can already be controlled. Basically the situation of citizens working in the organization forms a long-term relationship in which the two parties have responsibilities, obligations and contributions between them. In such a situation, an employee will constantly assess his working situation and strive to achieve a balance between his inputs and contributions to the organization with the benefits received from the organization.

As discussed, the ability of the employee to increase output or productivity is limited so the alternative available to him to respond to the services of either the organization or in particular the supervisor or its head is to increase the tendency for high and satisfactory work performance. The teacher is responsible for many matters related to the school institution. This includes efforts to achieve school education policy, managing and administering academic and non-academic matters, curriculum and co-curriculum, welfare of the school community as well as creating a climate and culture conducive to self-learning . Generally, school leadership can be said to be an effort, process and ability and behavior of a teacher to influence colleagues in his organization to perform tasks to achieve educational goals and policies.

Conclusion

In conclusion, it is hoped that the findings of this study can be the basis for improving the performance and quality of STEM teachers in the future. In the context of STEM teacher performance model, the findings of this study can increase the treasures of knowledge in the educational environment and other fields such as social sciences, methodology and psychology. The findings indicate an effort towards finding ways to improve contextual performance among STEM teachers, through high generic skills. Although the findings of this study have led to the proving that self-efficacy fails to act as a mediator, research is still required from other researchers in the future through the position of other variables.

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