

Relationship Between Inservice Training With Students' Achievements At TVET Insitutions In Malaysia

Wan Mohd Rashid Wan Ahmad, Ahmad Esa,
Berhannudin Mohd. Salleh, Zulida Abd Kadir, Hairani Razali.

Universiti Tun Hussein Onn Malaysia

Email: mdrashid@uthm.edu.my

Abstract

In-service training in the field of Technical Vocational Education and Training (TVET) acts as a catalyst for students' achievements. Nevertheless, studies on the matter is still lacking especially in the context of its contributions by the teachers attending the training with students' achievements. This study, thus, aims to identify the effectiveness of in-service training attended by teachers at TVET institutions in Malaysia. Data gathered was collected using two sets of questionnaire, Set A and Set B. Set A was distributed to 43 teachers from technical schools while Set B was given out to 1225 students of the 43 sample teachers. Data collected was recorded and descriptive statistic analysis was carried out using SPSS version 12. Among the analysis carried out was the t-test to identify for differences in students' achievements whom the teachers taught either by those who have or have not attended any related in-service training. Findings of the study found significant relationship between in-service training attended by the teachers and teachers' teaching effectiveness, teachers teaching effectiveness with students' achievements as well as between in-service training with students' achievements.

Keywords: TVET (Technical Vocational Education and Training) and In-service Training.

Introduction

Training or human resource development is defined as activities involved in raising skills, knowledge and behavioral change (Baharudin Razali, 1996). According to Tracey (1984), training and development comprise all activities aimed at developing career and new skills for employees to enable them become more productive continuously. Meanwhile, Nadler (1984) defines human resource development as a systematic learning experience at a particular time and designed to create change in behavior. The aim of human resource development is to achieve high quality work and produce products or service of utmost quality in the organizational surrounding and context where development is taking place (Kremp and Pace, 2001). Thus, it can be summarized that human resource development is closely related to training, knowledge and behavioral change.

Dearden et al. (2005) conducted a study on industrial data acquired from the British Data Panel from 1983 till 1996 in order to identify the effect of training on productivity and wage. They found out that training that was related to task had high significant relationship with productivity. Every increment of 1 % in training resulted in increment in productivity added value of 0.6%. Other kinds of training outside of task area were recommended towards increasing the productivity of the workers. A study by Everett (2004) from the Institute of Organization Performance, United States was conducted to identify the training relationship with workers' performance for Studio City Sheraton Hotel whereby the results show that there was evidence of relationship between training and work performance of the hotel staff.

Several studies were done on the effectiveness of human resource development program in Malaysia and overseas. Wilson and Harris (2003), Knox et al. (2003) and Betts (2003) did a study on the relationship between teachers' effectiveness and students' achievements. However, there are insufficient studies on similar issues especially at TVET institutions in Malaysia specifically secondary technical schools. This study is a continuation of a study conducted by Wan Mohd Rashid (2000) who suggested that more detailed studies on the effect of in-service training for staff development programme be carried out.

The objective of this study was to identify the effectiveness of in-service training attended by teachers on their teachings in TVET and students' achievements. Generally, the findings of the study show that in-service training produce positive results on the part of the teachers in technical and vocational disciplines in Malaysia.

Related Work

A lot of studies on the effectiveness of in-service training on the performance of workers at private firms both locally and abroad have been done. However, very few studies were carried out on the relationship between in-service training and students' academic performance especially in technical and vocational education. However, the numerous studies carried out on workers at firms serve as a guide in course of this study. This is because teachers too serve as workers but in an educational organization and they are also not exempted from attending in-service training programs.

Dearden *et al.* conducted a survey on industrial data that was collected from the British panel data from 1983 to 1996. This was to identify the effect of training on productivity and

salary. They found that training which was related to their job had high significance related to productivity. Every one percent improvement in training causes an improvement of 0.6 percent in productivity. Other trainings, which are beyond their job scope, are also proposed by them in promoting the employees productivity. Everett (2004) from the Institute of Organization Performance, United States of America, conducted a study on identifying the relationship between training and performance among hotel employees of Sheraton Studio City Hotel. The hotel was facing financial and staff management difficulties hence a study was carried out. Training was carried out on the hotel staff that focused on cooperation, trust and staff motivation. His findings revealed that there was significant relationship between training and workers performance. The outcome of the training resulted in reducing staff turnover by 20% and increase customer satisfaction by 8%. It also raised the share market value by as much as 24%.

Meanwhile, other studies conducted by Morin (2004) on 1484 workers in Canada revealed that their participation some kind of training program known as University Corporate Training has little effect on one's work performance but produced positive relationship with work performance. Krueger and Rouse (1998) who studied on educational effect at the workplace on salary, turnover and worker's performance found that in-service training had positive relationship with work performance in two sectors, namely, manufacturing and the public. Saks (1996) did a study on the number of training program attended by workers with worker's performance. A total of 152 new workers were selected as samples and analysis of the study found that the number of training programs received by the workers had significant relationship with work satisfaction, commitment and work performance. Meanwhile, a study on the relationship between on-the-job training with workers' productivity was conducted by Bartel (1995) and he discovered that it had positive and significant relationship not only on changes in the workers' performance but wage increment as well.

A study on training relationship with work performance was also carried out in Malaysia. For example, a study by Baharudin (1996) on 30 workers of Small-Medium Industry (SMI) owned by the Bumiputera (Son of the Earth) in the city of Johor Bahru found that induction training program carried out had positive and significant relationship on the workers' performance of the lower rank. Ahmad (1997) did a study on in-service training needs among staff of the Kluang Veterinary Institute involving 60 respondents as samples. His study found that the majority of the respondents agreed that the training received had increased their performance in terms of knowledge, skills and behavioral change. Similar finding was also acquired by Azizah (1997) who did a study on Celcom Technicians from the East-coast region. Her study revealed that there was positive relationship between training with the technicians work performance but weak between age with work performance.

Nevertheless, the study done by Siti Fatimah (1998) on the relationship between in-service training and work performance showed a different finding from the other researchers above. Data was collected from 81 Batu Pahat Telecom technicians on several aspects of the training program attended, their perceptions towards the training in increasing their knowledge, skills and work attitude. Using Person Correlation analysis the findings showed there was no significant relationship between work performances among the technicians.

Therefore, in order to achieve long term outcome from any one training three important elements which are skills, attitude and knowledge and human development (human factor) must be given emphasis in strategic planning towards raising work performance (Belilos, 1997).

The effectiveness of any in-service training attended by a teacher in this study was assessed by the teacher and using the students' achievements of the respective teachers. According to Shaw (1995), assessment on effective and successful training can be measured among others using comments or views of trainees assessing the training attended, students' assessment on their teachers and also the students' improvement in learning through test and examination results, behavior and students' attendance. The position of teachers as a factor that has an impact on students' achievements other than school and student factors which Marzano (2000) identified that teachers produce as much as 13% impact on students' achievements.

This study also found that students taught by effective teachers in an effective school surrounding can achieve leaps in their achievements. To ensure that teachers are always effective in acquiring the necessary knowledge and skills the school or relevant authority must implement meaningful in-service training, ensure support and provide sufficient time for their teachers to apply what have been learned. One of the components that has direct or indirect relationship with teachers' teaching effectiveness as suggested by Cheng and Tsui (1996) are professional development activities that support the teachers' performance, expertise development and teachers' education as well as students' achievements.

A study by Cohen and Hill (2001) found that teachers whose in-service training is focused on the curriculum can teach well when what has been learnt are applied in the classroom. This study also shows that students' achievements are also good if their teachers participate in in-service training that focuses on the curriculum. In another study, Garet (2001) studied teachers' involvement in an in-service training that emphasized on Mathematics and Science subjects. He discovered that the teachers are more prepared to implement change in teaching practice, improved in knowledge and teaching skills when the training is very much related to daily experiences and parallel to assessment. Even though studies on in-service training programs are dominated by problem solving requirements there are also researchers who are interested to study on particular skills. As regards reading skills, McCutchen (2002) in his study found that a group of pre-school students achieved good results in their tests after their teachers attended in-service training on improving alphabetical pronunciation skills compared to other students whose teacher did not attend such in-service training.

Meanwhile, Darling-Hammond (2000) did a study on the quality of teachers and students' achievements in United States. She believes that teachers' qualification, education and staff development program do have relationship with students' achievements. All three elements can give clear differences in deciding teachers' capacity and quality in carrying out their teaching duties. This finding is also shared by Angrist dan Lavy (2000) who discovered that the in-service training received by school teachers in Israel has resulted in improving the examination results of their teachers. Zatta (2003) conducted a study on the effectiveness of the Massachusetts Curriculum Assessment System (MCAS-Alt) on disabled students' achievements. His findings show the existence of a relationship

between teachers' experience in administering MCAS-Alt with students' marks. The study also provides an important finding that teachers' involvement in professional development activities or in-service training has a positive impact on the teachers' performance and students' achievements. Nevertheless, Jacob (2004) in his study found marginal increment in in-service training attended by teachers in Chicago, USA did not have significant relationship with students' achievements in Mathematics and reading

There are numerous studies on teachers' effectiveness in teaching and learning. They are more focused on skills and characteristics of effective teachers. Borich (2003) discussed about teaching behaviors that have positive relationship with students' achievements. Five key behaviors of effective teachers have been studied consistently by researchers for the past two decades. The five key behaviors are learning clarity, variety in teaching, work orientation, commitment in teaching process and students' level of success and understanding. In another study, Andrews (2002) believes that effective teachers must be able to create a conducive atmosphere that allows students to like and can study. An effective teacher must also be able to identify students' aims, learning needs and styles. In addition, teachers must also have the ability to organize and present teaching materials that help students' learning and define required students' achievements as well as help in how they can be measured.

The above view is also shared in a study conducted by Wray and Medwell (2001). They believe that effective teachers often emphasize on students' knowledge in the teaching process. A teacher must also be someone who is knowledgeable in one's field and knows the right materials for use in order to increase understanding and students' self-development and not merely extracts from teaching content. Meanwhile, teachers who are effective with the school surrounding can influence students' achievements. This can be proven by a study conducted by Ornstein (1990) in Wan Mohd Rashid (2000) who found that students' achievements can be influenced by the teachers and school. The study reveals close relationship between teachers and school with students' achievements. Teachers play a very important role in changing the behavior of students through teaching and learning process. This includes technical and vocational teachers who act as guides for the students who need exposure to the latest knowledge and skills in order to secure future employment demands.

Students' achievements are influenced by teachers' teaching effectiveness other than individual and surrounding factors. Effective teachers' characteristics as presented by Morgan and Knox (1985) and Coker and Coker (1988) have a lot in common that can be categorized into knowledgeable, skillful, nurture good relationship with students and noble personality. However, effective teachers must also possess the ability to relate knowledge and skills with work setting.

Positive relationship between training and work performance and teachers' teaching effectiveness has been proven to exist by previous researchers like Darling-Hammond (2000), Garet (2001), McCutchen (2002) dan Everett (2004). Besides that, previous studies also found that teachers' participation in training programs can help raise students' achievements (Andrews, 2002 and Borich, 2003). Studies of students' achievements have been abundantly implemented by outside researchers. However, one question arises whether similar situation occurs at secondary technical schools in Malaysia especially in the state of Johor. This question sets the basis for the implementation of this study.

Methodology

This study is a quantitative study whereby data from questionnaire sets were analyzed to give meaning to the results obtained. Samples for this study comprised technical school teachers, senior assistants and students from five secondary technical schools that offer technical subjects under the administration of the Technical Education Department in the state of Johor, Malaysia - Sekolah Menengah Teknik Batu Pahat, Sekolah Menengah Teknik Kluang, Sekolah Menengah Teknik Muar, Sekolah Menengah Teknik Pontian dan Sekolah Menengah Teknik Segamat.

A total of 43 teachers comprising those who have and have not attended in-service training were selected as samples. From among the students, a total of 1225 students taught by each of the selected teachers were involved as samples. Four technical and vocational subjects were chosen for the study and they were Electrical Engineering Studies (EES), Mechanical Engineering Studies (MES), Civil Engineering Studies (CES) and Engineering Drawing (ED).

Item construction in the Questionnaire forms used to measure effectiveness in in-service training was adapted from the models by Tyler (Tyler, 1981) and Kirkpatrick (1998). An item for teachers' teaching effectiveness was adapted from Personnel Series Model 5001, Coker (Coker and Coker, 1988) and ILO (2001).

Before the questionnaire sets were distributed, a pilot study was conducted to test for reliability of the items constructed. 20 students and 24 teachers from technical schools in Johor were selected randomly to answer the questionnaire forms. Using Alpha Cronbach coefficient, Item A recorded an overall value of 0.959. Alpha Cronbach Coefficient values for each section in the questionnaire were also tested and it was found that Section B (items on in-service training effectiveness) recorded a value of 0.801, Section C (teachers' teaching after attending in-service training) 0.917 and Section D (teachers' teaching effectiveness) 0.947. Meanwhile Questionnaire Set B for students recorded a value of 0.921. Thus, it can be concluded that the questionnaire sets constructed were very suitable for use in the study. In addition, both sets of questionnaire were checked and verified by three experience lecturers.

Distribution of the questionnaire sets was done with the help of the Senior Assistants of the respective Technical Schools. The questionnaire sets were handed over to them who then distributed them to the teachers (samples). Prior to that, the researchers explained the objectives of the study to ensure that the samples understood instruments of the study. The teacher samples were given Questionnaire Set A while the students questionnaire Set B given to them by their teachers in class. Students were allocated 10 minutes to answer the questionnaire. The collected questionnaire sets were given back to the Senior Assistants who later handed them over to the researchers a week later. All the questionnaire sets distributed were successfully collected and they were labeled or categorized according to the name of the school and teacher code for each subject. Data collected was processed using SPSS version 12. Descriptive and several inferential statistics analysis like t-test and Pearson Coefficient analysis were used.

Findings

The analysis was conducted to identify changes in students' achievements in their 2003 and 2004 final examination results (Test 1 and Test 2 respectively). This analysis was done to answer the research question "Is there any difference in the students' achievements for those who were taught by teachers who did and did not attend in-service training". Data used was secondary data which is students' examination results. For the purpose, two kinds of analysis were used. They were descriptive analysis that measured effectiveness in teaching by individual teachers and according to subject as well as use of t-test to test for difference in overall examination mean result.

For descriptive analysis, the positive sign (+) indicates that there is increase or positive change from the first and second tests. Meanwhile, negative sign (-) shows decrease or wearing of students' examination marks from test 1 to test 2. Frequencies and percentages in number of students for each test was used to make comparisons between the two tests. This analysis did not involve the 6 teachers from SMT Pontian because the school only started operation in early 2004. As such, the 2003 final examination marks data were not available. Students were categorized as pass if they scored a minimum of 40% and classified as excellent if they scored a minimum of 70% with a minimal grade of 2A (Table 2).

For the EES programmed, only four (4) out of nine (9) teachers selected had attended in-service training. Three of them (75%) recorded an improvement in the percentage of students who scored a pass as well as excellent (Table 1). Three out of five of the teachers (60%) had not attended any in-service training but showed improvements in the percentage of students who obtained a pass. In addition, only 40% of the teachers who did not attend in-service training succeeded in producing students who obtained excellence. Figures for teachers who attended in-service training were much higher than for those who did not do so.

The mean score values in the last column are the average value for the students' perception of their teachers effectiveness in teaching. For G1 and G16 teachers, they did not attend any in-service training and this contributed to the decrease in the percentage of pass and excellent among their students. This can be shown by the mean score value for teaching effectiveness that is lower among the teachers teaching EES subject which was at 2.257 and 2.783. For teachers who showed increment in the percentage of students who excelled they seemed to have high mean score value for effectiveness.

Table 1: Percentage of passes and number of excellent according to school and teacher for EES subject

School	Teacher	Percentage of Passes		+/-	Number of Excellent (%)		+/-	Average Score
		Test 1	Test 2		Test 1	Test 2		
SMTK	G1*	44.0	8.0	-	2 (8.0)	1 (4.0)	-	2.257
SMTK	G6*	25.0	31.8	+	0 (0.0)	1 (4.5)	+	3.104
SMTK	G11*	39.1	52.0	+	2 (8.8)	2 (8.0)	-	3.100
SMTS	G16*	83.3	44.4	-	2 (11.1)	0 (0.0)	-	2.783
SMTS	G19	59.1	95.5	+	1 (4.5)	4 (18.2)	+	3.033
SMTM	G27	75.0	79.5	+	6 (25.0)	3 (12.5)	-	3.028
SMTM	G28*	61.3	64.5	+	0 (0.0)	3 (9.7)	+	3.158
SMTBP	G34	78.9	89.5	+	9 (47.4)	10 (52.7)	+	3.328
SMTBP	G35	75.0	55.6	-	2 (7.1)	7 (25.9)	+	3.532

*Teacher who did not attend the in-service training for the years 2003 and 2004

Among MES teachers, a total of six (6) teachers (75%) had attended in-service training while only two (2) had not. Among the six, 83.3% showed increment in percentage of students who achieved a pass while 66.67% of the six teachers scored a rather low mean score in effectiveness. For example, Teacher G9 and G23 each scored 2.746 and 2.647 respectively. Even though the mean scores for both teachers were low their percentage of students who passed showed an improvement from the first test compared to the second. In general, for MES subject the in-service training attended by the teachers have succeeded in raising students' achievements in the examination. Table 2 shows the percentage of pass and excellent among students for examination years 2003 and 2004 for the particular subject.

The percentage of passes and number of excellent among students for CES is shown in Table 3. It was found that six (6) of the CES teachers had gone through in-service training throughout the year 2003 and 2004. Among them, more than half recorded their improvements in both situations which are percentage of students who obtained a pass and excellent. Only G18 teacher did not show any changes in the number of students who excelled teacher G17 recorded the lowest mean score value on effectiveness besides decrease in the number of students who passed and excelled.

Table 2: Percentage of passes and number of excellent according to school and teacher for the MES subject

School	Teacher	Percentage of Passes		+/-	Number of Excellent (%)		+/-	Average Score
		Test 1	Test 2		Test 1	Test 2		
SMTK	G4	43.5	91.3	+	0 (0.0)	2 (8.7)	+	3.577
SMTK	G9	45.2	62.8	+	1 (3.2)	1 (3.2)	No changes	2.746
SMTK	G10	80.6	93.1	+	4 (12.9)	2 (6.9)	-	3.404
SMTS	G12*	87.5	88.0	+	9 (37.5)	10 (40.0)	+	3.093
SMTS	G15*	100.0	92.9	-	7 (24.1)	14 (50.0)	+	3.235
SMTM	G23	52.0	61.5	+	8 (32.0)	0 (0.0)	-	2.647
SMTM	G24	57.1	89.3	+	2 (7.1)	7 (24.9)	+	3.310
SMTBP	G30	95.0	100.0	+	7 (35.0)	19 (100)	+	3.040

*Teacher who did not attend the in-service training for the years 2003 and 2004

Nevertheless, teacher G32 also recorded a decrease even though they have attended in-service training and the mean score value for teachers' teaching effectiveness was rather high at 3.330. The study shows that teacher G32 was an experienced teacher and involved in the administrative duties at the school. Students rated the teacher as effective due to his experience in teaching. However, administrative duties and out of office work commitments have affected his/her students' achievements.

Table 3: Percentage of passes and number of excellent according to school and teacher for the CES subject

School	Teacher	Percentage of Passes		+/-	Number of Excellent (%)		+/-	Average Score
		Test 1	Test 2		Test 1	Test 2		
SMTK	G7	40.6	80.0	+	1 (3.1)	7 (23.3)	+	3.200
SMTS	G17*	85.2	40.7	-	13 (48.1)	0 (0.0)	-	2.781
SMTS	G18	100.0	90.0	-	6 (20.0)	6 (20.0)	No Changes	2.963
SMTM	G25	100.0	76.7	-	14 (46.7)	17 (56.8)	+	3.048
SMTM	G26*	85.0	76.4	-	8 (28.6)	4 (17.9)	-	3.317
SMTBP	G31	76.0	96.0	+	9 (36.0)	21 (84.0)	+	3.601
SMTBP	G32	100.0	95.7	-	15 (68.2)	12 (52.2)	-	3.330
SMTBP	G37	33.0	58.3	+	8 (25.0)	12 (37.5)	+	3.291

**Teacher who did not attend the in-service training for the years 2003 and 2004*

The percentage of students who passed and excelled in ED subject is displayed in Table 4. It was found that all the teachers who taught the subject have attended in-service training in 2003 and 2004. The percentage of students who passed was high at 91.67%. Meanwhile, 75% of them showed increment in the number of students who excelled. The mean score value for teachers' teaching effectiveness was high between 3.101 and 3.505. Teachers who recorded students with excellent results that decreased had relatively low mean score for effectiveness as compared to other teachers. In general, the in-service training attended by the ED teachers had been effective in raising the achievements of their students.

The t-test was used to find out whether there was significant difference in students' examination results for those who were taught by teachers who had and had not attended in-service training. For the purpose, the 2004 final year examination result was used as the dependent variable. If the value of t was sufficiently large then null hypothesis was rejected, meaning that there was significant difference in student examination results. Results of the t-test are presented in Table 5. F-test was carried out to test similarity of variants among mark distribution for students. It was recorded as small which was 0.001. Significant value was 0.981 and larger than 0.005 concluding that the students' mark variants from the two groups of teachers who had and had not attended in-service training were not different. Meanwhile, t-test value was at -5.547 with a Standard Deviation of 1223. The negative sign for t-test shows that students' marks were much lower for those who were taught by teachers who did not attend in-service training as compared to those otherwise. Significant value recorded was 0.000 that proved that there was significant difference on students' achievements that were taught by teachers who attended in-service training. Hence, Null Hypothesis was rejected.

Table 4: Percentage of passes and number of excellent according to school and teacher for the ED subject

School	Teacher	Percentage of Passes		+/-	Number of Excellent (%)		+/-	Average Score
		Test 1	Test 2		Test 1	Test 2		
SMTK	G2	65.6	93.5	+	10 (31.3)	18 (58.1)	+	3.200
SMTK	G3	63.0	75.0	+	6 (22.2)	16 (57.2)	+	3.483
SMTK	G5	32.0	88.0	+	3 (12.0)	16 (64.0)	+	3.164
SMTK	G8	53.4	78.3	+	3 (14.3)	1 (4.3)	-	3.169
SMTS	G13	73.7	75.2	+	4 (21.1)	10 (52.6)	+	3.297
SMTS	G14	77.4	93.3	+	3 (9.7)	17 (56.7)	+	3.504
SMTM	G20	62.5	66.7	+	4 (16.7)	3 (12.5)	-	3.101
SMTM	G21	7.4	89.3	+	0 (0.0)	9 (32.1)	+	3.421
SMTM	G22	89.5	72.2	-	8 (42.1)	4 (22.2)	-	3.124
SMTBP	G29	14.3	90.5	+	1 (4.8)	7 (33.3)	+	3.418
SMTBP	G33	7.4	10.4	+	0 (0.0)	0 (0.0)	No changes	3.346
SMTBP	G36	84.4	86.7	+	11 (34.4)	17 (56.7)	+	3.383

Table 5: T-Test for comparisons between achievements of students taught by teachers who have and have not attended in-service training.

	Levene's Test for variance		t-test			Mean	
	F	Sig	T	Df	Sig. (2 tailed)	No Training	Trained
Effectiveness of in-service training	0.001	0.981	-5.547	1223	0.000	44.55	50.74

* significance level at 0.05

The relationship between effectiveness in in-service training with teachers' teaching effectiveness according to school was positive as shown in Table 6. Findings show that the Correlation Coefficient value was high from 0.70 and 0.88 and significant at alpha level 0.05. A high Correlation Coefficient indicated strong relationship in effectiveness in in-service training with teachers' teaching effectiveness. SMT Batu Pahat recorded a high Correlation Coefficient value at 0.883 while SMT Pontian the lowest at 0.704. As such, it can be concluded that the effectiveness in in-service training attended by technical and vocational teachers with teaching effectiveness was significantly strong.

Table 7 displays the Correlation Coefficient between effectiveness in in-service training with teachers' teaching effectiveness according to subjects. All the Correlation Coefficients were significant at alpha level 0.05 that resulted in Null Hypothesis being rejected. EES recorded the highest Correlation Coefficient of 0.975 and followed by MES at 0.794. The finding reveals positive and strong relationship between effectiveness in in-service training with teachers' teaching effectiveness for EES and MES. Meanwhile, for CES and Engineering Drawing subjects, the Correlation Coefficient was recorded as moderate at

0.629 and 0.699 respectively. Findings show positive and moderate relationship between effectiveness in in-service training with teachers' teaching effectiveness of CES and ED.

Table 6: Relationship between effectiveness of in-service training with effectiveness of teachers' teaching according to school

School	Correlation Coefficient	p-Value
SMT Pontian	0.704	0.000*
SMT Batu Pahat	0.883	0.000*
SMT Muar	0.732	0.000*
SMT Segamat	0.789	0.000*
SMT Kluang	0.713	0.000*

* significance level at 0.05

Table 7: Relationship between effectiveness of in-service training with effectiveness of teachers' teaching according to subject

Subject	Correlation Coefficient	p-Value
Electrical Engineering Studies	0.975	0.000*
Mechanical Engineering Studies	0.794	0.000*
Civil Engineering Studies	0.629	0.000*
Engineering Drawing	0.699	0.000*

* significance level at 0.05

The next analysis was to identify the strength of the relationship between students' achievements through examinations marks with teaching effectiveness of technical and vocational teachers. It was found that the Correlation Coefficient was weak which was between 0.219 and 0.389 but was significant at alpha level 0.05 for all schools (Table 8). The positive and weak Correlation Coefficient values showed that there was positive but weak between teachers' teaching effectiveness with students' achievements at all secondary technical schools studied. However, SMT Batu Pahat recorded the highest Correlation Coefficient at 0.389. Meanwhile, SMT Pontian had the lowest at 0.219. This shows that there was enough evidence to reject Null Hypothesis. It can thus be said that there was significant relationship between teachers' teaching effectiveness with students' achievements of the respective secondary technical schools.

The Correlation Coefficient between students' achievements and teachers' teaching effectiveness according to subjects (EES, MES, CES and Engineering Drawing) was significantly low at alpha level of 0.05 (Table 9). This means students' achievements had positive relationship but low with their teachers' teaching effectiveness. Engineering Drawing subject recorded the highest Correlation Coefficient of 0.395 but lowest for MES at 0.272. Therefore, it can be said that teachers' teaching is very crucial and has significant relationship with their students' achievements.

Table 8: Relationship between students' achievement with effectiveness of teachers' teaching according to school

School	Correlation Coefficient	p-Value
SMT Kluang	0.312	0.000*
SMT Batu Pahat	0.389	0.000*
SMT Muar	0.340	0.000*
SMT Segamat	0.303	0.000*
SMT Pontian	0.219	0.007*

* signifiacnce level at 0.05

Table 9: Relationship between students' achievement with effectiveness of teachers' teachings according to Subject

Subjects	Correlation Coefficient	p-Value
Electrical Engineering Studies	0.384	0.000*
Mechanical Engineering Studies	0.272	0.000*
Civil Engineering Studies	0.362	0.000*
Engineering Drawing	0.395	0.000*

* signifiacnce level at 0.05

The next step was to identify they relationship between the students' achievements and the effectiveness of the in-service training attended by their teachers. For the purpose, correlations analysis was carried according to school and subject and the results are shown in Table 10 and 11. A positive Correlation Coefficient illustrates that the relationship between the students' achievements and effectiveness of the in-service training attended by their teachers was positive and significant at Alpha level of 0.05 for all the secondary technical schools and the subjects studied. Overall, findings of the study showed that in-service training attended by technical and vocational school teachers can increase students' achievements in examinations. As regards correlation coefficient, SMT Batu Pahat and SMT Muar recorded a moderate value of 0.491 and 0.490 respectively. This means there was positive but moderate relationship between in-service training effectiveness and students achievements for both schools. Engineering Drawing subject recorded the highest correlation coefficient value among subjects studied.

Table 10: Relationship between effectiveness of in-service training with students' achievements according to school

Schools	Correlation Coefficient	p-Value
SMT Kluang	0.339	0.000*
SMT Segamat	0.376	0.000*
SMT Muar	0.490	0.000*
SMT Batu Pahat	0.491	0.000*
SMT Pontian	0.361	0.000*

* signifiacnce level at 0.05

Table 11: Relationship between effectiveness of in-service training with students' achievements according to subject

Subjects	Correlation Coefficient	p-Value
Electrical Engineering Studies	0.277	0.000*
Mechanical Engineering Studies	0.235	0.001*
Civil Engineering Studies	0.335	0.000*
Engineering Drawing	0.352	0.001*

* significance level at 0.05

The Correlation Coefficient values for other technical school education and subjects were low which was between 0.20 and 0.40 but significant at Alpha level 0.05. Overall, the analysis showed significantly low relationship between in-service training attended by the technical and vocational teachers and the achievements of their students. Even though this study reveals the existence of low and moderate relationship among variables but it is still significant at alpha level 0.05. This proves that the relationship did not exist by coincidence. The low Correlation Coefficient value in this study also occurs in the education, psychology and other social sciences studies (Mohamed Najib, 1999). Nevertheless, the findings of this study served as the starting point which can contribute towards important discoveries and can be used to establish theories (Burns, 2002:242).

Discussion

Using descriptive and t-test the analysis it was found that there was significant difference among the two groups of students. This means that students' achievements were significantly different for the two groups of teachers. Viewed from changes in students' achievements in both tests conducted according to subjects most teachers succeeded in raising the number of students who passed with excellence in EES, MES, CES and Engineering Drawing subjects. Nevertheless, for teachers with more 20 years of experience but did not attend in-service training they were also found to be successful in raising the number of students who passed excellently. This finding is parallel to the ones conducted by Porter and Lawler (1968) who said that one's experience in any one career can have an influence on his/her career performance. Experienced teachers are more sensitive and aware to the signals shown by their students' behavior and have thought and applied various teaching techniques in their teaching and learning processes (Elliot *et al.*, 1996). They are also more flexible and able to maintain closer personal relationship with their students (Agnes, 1992).

Classroom context, school and the surrounding also influence the students' achievements (Research Matters, 2002). The Contextual Model for learning process at school as proposed by Biggs and Moore (1993) is shown in Figure 1. This model provides indicates that teaching and learning effectiveness of technical and vocational teachers' has an effect on their students' achievements. Meanwhile, the findings of this study show that the training attended by the teacher has significant relationship with the teachers' teaching effectiveness. However, the model proposed by Biggs and Moore (1993) does not contain any training element. As such, training element attended by the teachers must be considered in the Contextual Model because indirectly it will influence the students' achievements.

Analysis of the study reveals that there was significant and strong relationship between in-service training effectiveness attended with the teaching effectiveness of technical and vocational teachers either according to school or subject. It can be concluded that in-service training attended by the teachers is very important in raising their teaching effectiveness. Analysis of the study reveals that SMT Batu Pahat had a high coefficient correlation value considering that SMT Batu Pahat teachers had the highest overall mean score in their teaching effectiveness. Meanwhile, SMT Segamat had the second highest overall mean score in teaching effectiveness and their teachers had the highest mean score value in technical skill related to the subjects they teach. When this happened, it means the teachers' teaching effectiveness score also increased. Improvement in skills is a most important aspect for the teachers to gain through in-service training programs in order to make them more effective.

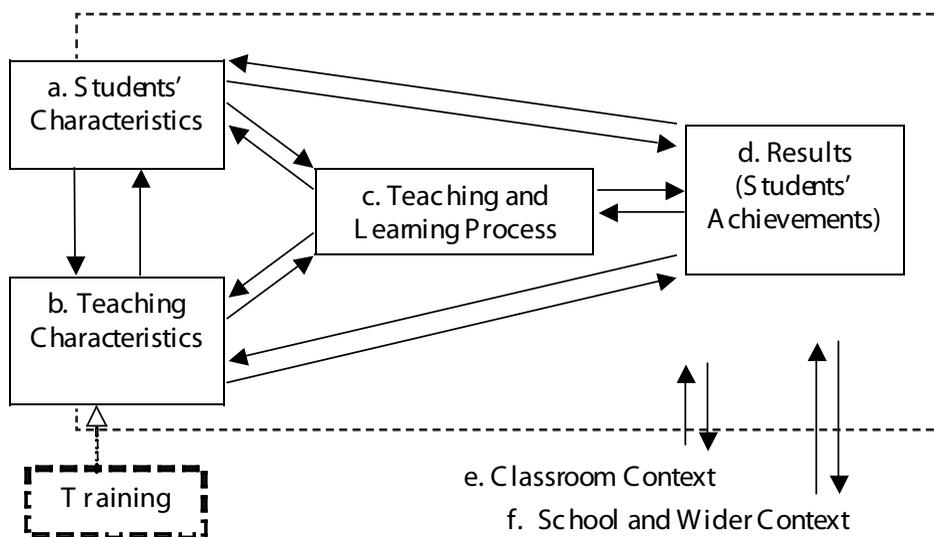


Figure 1 : Contextual Model for Teaching at School adapted from Biggs and Moore (1993) in Research Matter (2002:1)

Findings of the study also show significant relationship between teachers' teaching effectiveness with students' achievement at all schools involved. This is parallel to the findings of a study conducted by Ornstein (1990), Darling-Hammond (2002) and Zatta (2003). Their studies indicate that teachers' involvement in in-service training programs had positive relationships with the teachers' teaching effectiveness in carrying out their teaching tasks that led to significant relationship with the students' achievements. Meanwhile, all the subjects involved in the study show positive relationship between students' achievement with teachers' teaching effectiveness. Nevertheless, the correlation coefficient for MES teachers was the lowest. Findings show that the MES teachers were less effective in motivating their students to carry out "hands-on" learning activities compared to the three other subjects.

Findings of the study reveal positive relationship between in-service training attended by the technical and vocational teachers with students' achievements for all the technical schools and subjects studied. In general, in-service training plays a very important role in

raising the teachers' teaching performance and the students' achievements. The findings of this study show that there was significant relationship between in-service training with teachers' teaching effectiveness, students' achievements.

The study found most in-service training programs were implemented during school holidays that contributed to insufficient, less frequent and non-continuous training sessions. The school management and teachers felt that in-service training programs conducted during the school session interrupted the teachers' daily routines. As teachers at technical education institutions it is crucial that all the skills and knowledge learnt during the training period must be put into practice with their students at schools. The study also found that a number of technical and vocational teachers were not able to use the suggested teaching aids because they were not available at the school concerned. This situation should not be happening at technical and vocational schools considering that technical skills are crucial learning requirements. The effectiveness of training outcomes should be seen from the aspects of skills and knowledge learning application at the workplace (Fletcher, 1995). Such matter will result in cost wastage considering the huge amount of money spent for training program incurred. This problem can also have an effect on the teachers' motivation in achieving their objectives hence the organization they work at. One's feeling towards expertise in "self-efficacy" concept is very much related to motivation. This concept explains that personal expertise and beliefs that teachers can execute their tasks excellently will decrease when their motivation decreases (Blanchard and Thacker, 2004).

The in-service trainings attended by teachers also had positive relationships with their teaching effectiveness. This was crucial for raising the interest of the teachers towards the subject they are teaching and the teaching profession as well as raising self confidence. Nevertheless, the in-service training planned by the top brass was less helpful in developing interpersonal relationship skills among teachers and students, motivational and communication skills. There were several training aspects which were at a low score and this should be rectified. However, it can be concluded that the in-service training program attended by the technical and vocational teachers had significant relationship with the teachers' teaching effectiveness for all schools and subjects studied.

Technical teachers need to attend continuous in-service training programs and should be able to improve in their teaching effectiveness. An effective training program will produce effective teachers and ultimately produce successful students. Students' performance at secondary technical schools also had significant relationship with in-service training attended by the teachers. Students' achievements are the most important outcome of any teaching and learning process. As such their performance is very much dependent upon the teaching effectiveness of their teachers who need to participate in the professional development programs like the in-service training programs.

Findings of this study prove that there were differences in information concerning teachers' teaching effectiveness at technical and vocational schools. Nevertheless, the perceptions of both parties focus on interest, skills and skill application, interpersonal relationship as well as counseling and guidance skills. Professional expertise like possession of technical skills, interest, dynamism and ability to relate concept with the students' daily life were considered by the technical and vocational teachers as the main characteristics required of them that should make them effective teachers. The students of technical

schools considered their teachers had low interpersonal skills among teachers and students. Actually, interpersonal relationship must be viewed as one of the main characteristics in measuring teaching effectiveness. Due recognition, motivation and good guidance shown by teachers also form crucial elements that can help raise the teaching qualities of teachers in the classroom. It is also found that the teachers concerned lack counseling and guidance skills even though both these aspects form important elements in teaching effectiveness of teachers (Coker and Coker, 1988). Such skills are able to attract the students' interests towards their studies. Other than that, it was also revealed that the unavailability and lack of use of teaching aids led to ineffective teaching hence poor students' performance. "Hands-on" activities must be emphasized for all technical and vocational subjects. Teachers need to provide opportunities for students to develop their thinking, psychomotor and problem-solving skills especially in the use of technology in teaching (Norton and Wiburg, 2003)

If viewed from the perspectives of school and subjects, the findings show that SMT Batu Pahat had the most number of effective teachers compared to teachers from other technical schools concerned. Mean while. SMT Pontian reveals the most number of teachers with ineffective teaching. Other than in-service training, factors like experience plays a role in moulding the ability and professionalism of teachers. Teachers teaching Technical Drawing subjects were identified as teachers with the highest level of teaching effectiveness but the situation was the opposite for EES teachers. Teachers' teaching effectiveness was supported by effectiveness in in-service training attended that led to positive relationship in the technical and vocational students' achievements.

Conclusion

The achievements of the students formed the major output in the learning process and indirectly it was due to the effectiveness of the in-service training attended by their teachers. As such, the assessment done on the in-service training under the Ministry of Education must be seen as a positive effort aimed at raising the standard of the existing programmed as well as to provide information in assessing the teachers' teachings and raise the learning outcome of the students. Technical and vocational teachers must be equipped with the appropriate knowledge and skills and are supposed to compete in the present and future education and job markets. It is hoped that the findings, conclusions and recommendations gained from this study will contribute towards improving the in-service training programmed, raising the teaching effectiveness of the teachers and ultimately the students' achievements.

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