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A Conceptual Model for Vocational Teaching Method as An Approach to Enhance Students Learning

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Abstract

The purpose of this study is to identify the teaching method practices of the practical work subject in Vocational Secondary School (VSS). The subject chosen in this research is Automotive. This study examined the practice of Vocational Teaching Method (VTM) in Automotive Practical Work (APW). The research objectives are to investigate students' and teachers' preferences in teaching APW, to identify the relationship between teaching methods, implementation of competency concept in APW, how students' exploring knowledge in APW and how teachers conduct practical task in APW. The quantitative method used the sets of the questionnaire. 283 students and 63 teachers involved from ten VSS involved in this research. This study applied the descriptive analysis, inferential and discussion analysis to elaborate the data. The quantitative data was analyzed by using descriptive and inferential statistics. Using Gary (1996) in practices of teaching practical work subject and elements of Automotive curriculum by MOE (2006), which contained introduction, body and conclusion as main elements research finding shown in an introduction of APW teachers used the demonstration (Demo) and questioning technique (QT), in body session teachers prefer group monitoring (GP) and problem solving (PS) while, in conclusion, session teachers chose re-explain (R-ex) and report writing (RW). VTM-APW also involved the competency-based concept (CBC) to embed in the model. Derived from factors investigated, research produced the combination of elements in teaching skills and vocational skills which could be used as the best teaching method in automotive practical work for school level. Finally this study has concluded that the VTM-APW model is able to apply in teaching to make an improvement with current practices in VSS. Thus, VSS teachers are proposed to use this method to gain student's knowledge in automotive and help teachers deliver skills to the current and future workforce in a flexible manner and at a consistent level of quality.

Keywords: Vocational teaching method, practical task, teacher preferences, student preferences

INTRODUCTION

Malaysia is concerned that the factors in producing human capital start at the school level. The school system in Malaysia provides the opportunity for students to develop their carrier path as early in sixteen years old. For example, in secondary school, various vocational courses are offered for those students who show more preference in hands on subjects. Thus to accomplish the students' need and to produce skilled industrial workers, the Ministry of Education (MOE) has developed a blueprint for an educational reformation plan which sets the policies, priorities, strategies and action plans for improving the education system from preschool up to tertiary education. The goal of the education blueprint is to produce human capital by ensuring quality education for all (EPRD, 2006). The image uplift of vocational education is due to the corresponding increased importance of employment in industrial sectors, the efforts at promoting vocational education by the government and the changing nature of vocational programs. MOE also planned to improve the quality of teaching so that the quality of vocational education especially in school level also improves.

The role of teachers should also change. Besides being a tutor, coach or instructor, teachers should make an effort to gain knowledge, especially knowledge in their field of expertise. Effective and positive teaching derived from vocational education programs can have a direct impact especially on students who need hands-on curriculum. Lewis (2000) believes that secondary vocational classes need to be more flexible and aligned with the reality of students' development and the growing technological concerns of modern society. The primary goal of education is to develop reasoning and problem solving within a field of practice. Effective teachers should try to encourage students to think with higher order questioning techniques and to be more critical in their assessments (Ruthland & Bremer, 2003).

Nowadays, teachers in schools are provided with facilities to make teaching process easier. They will deliver the course content based on teaching aids, text books and other learning materials using a variety of teaching methods. There are no specific delivery system guidelines for teachers of vocational subjects to follow. Teachers should make their own effort to explore the best way and prepare themselves with what their students need while being more creative in delivering the subject content. The unit of staff development in Division of Technical and

Vocational Education (DTVE) MOE, planned and implemented certain courses to fulfill the requirement of current students by sending teachers to attend courses and also to prepare them for the changing system in vocational school.

STATEMENT OF PROBLEM

In Malaysia, there it is less specific guide such as a model or framework on how to teach practical work subject. Teachers have the ability to teach practical work but they can function more efficiently if they had specialized guidance on how to deliver the subject matter that can match student needs. It also will encourage teachers to improve their teaching and automotive skills if they had a model they can refer to. However, most teaching activities can be divided into three broad categories to bring about desired learning, changes in student behavior and to enhance student development. In Technical and Vocational Education (TVE), the teacher must be able to deliver skills which match new technologies and practices in industry, and deliver skills to the current and future workforce in a flexible manner and at a consistent level of quality. Teachers need support to develop and carry out the necessary knowledge and skills related to the curriculum. Research analyzed one of the course offered in Vocational School and the examination result analysis of Automotive showed that all students can achieve the minimum grade, yet it still not enough to represents that students are able to do the best job practical task. The role of teachers are very important to make sure students will perform well while complete the practical task. Research taking into account the analysis of the study and specializes in Automotive field and results can be applied to other areas. Therefore this study was conducted is to identify the practice of Vocational Teaching Method (VTM) in Automotive Practical Work (APW). Derived from factors selected, research produced the combination of elements in teaching skills and vocational skills which could be applied as teaching method in automotive practical work for school level.

RESEARCH OBJECTIVES

i. To identify the relationship between teaching methods; introduction, body and conclusion
ii. To investigate how teachers implement competency concepts in automotive practical work which contain knowledge and understanding, skills and attitudes
iii. To identify on how do students explore knowledge in automotive practical work based on knowledge and understanding, skills and attitudes?

RESEARCH METHODS

The quantitative method used the sets of the questionnaire. 283 students and 63 teachers involved from ten vocational schools involved in this research. This study applied the descriptive analysis, inferential and discussion analysis to elaborate the data.

Items Construct

Both sets of questionnaires for students (Set I and II) the items construct based on subject specification in Automotive Module. It was focused on practical work content in Electrical Automotive Diesel and Automotive Vehicle. There is sub-module in this subject which covers practical tasks. It also refers to module objectives. Table 1 presents the learning outcomes in Electrical Automotive Diesel which are used to construct the items in Set I. Table 2 illustrates learning outcomes in Automotive Vehicles used to construct items in Set II.

Table 1: Learning Outcome in Automotive Electrical Diesel Module

Learning Outcome (LO)	Tasks
LO 1	Doing the tracing diagram of electrical, examine,, service and repair the vehicles system
LO 2	Using tools and workshop equipment
LO 3	Procedure in problem solution
LO 4	Decision making in tracing, examine, and problem solving in vehicle component
LO 5	Knowledge and skill application related with task and automotive industry
LO 6	Work ethic
LO 7	Knowledge and skills development for preparation in place of work and ability to cater to new knowledge and skills

Table 2: Learning Outcomes in Automotive Vehicle

Learning Outcome (LO)	Tasks
LO 1	Diagnose, examine, service and identify the failure of engine system and vehicles
LO 2	Using the electronic tester and workshop equipment
LO 3	Procedure in problem solution
LO 4	Decision making with rational reason in examining, testing and repairing the vehicle component
LO 5	Knowledge and skill application related with task and automotive industry
LO 6	Work ethic
LO 7	Knowledge and skills development for preparation in place of work and ability to cater to new knowledge and skills
LO 8	Application of geometrical drawings related to automotive engineering

Set III is the questionnaire for teachers. It contained two parts: Part A contained items such as gender, teaching experience, qualification, industrial experience, industrial attachment and courses attended. Part B asked for teacher preferences when conducting practical work in APW. Table 3 shows the details.

Table 3: Questionnaires Specification for Teachers

Categories	Items	No of Items
Part A	Gender	2
	Teaching experience	4
	Academic qualification	5
	Other qualification	2
	Industrial experience	1
	Industrial attachment	1
	Teaching improvement courses	1
Part B		
Introduction	Introduction	6
Body	Body	9
Conclusion	Conclusion	6

Set IV is the questions related to competency-based concept as proposed by MOE embedded in automotive curriculum. The focus of this concept is knowledge, skills and attitudes. Table 4 presents the items in this set.

Table 4: Items Division

Competency-based	Items
Knowledge	1,2,3,4,5 and 7
Skills	8,9,10,11,12,13 and 14
Attitudes	15,16,17,18,19 and 20

RESULTS

i) To identify the relationship between teaching methods; introduction, body and conclusion

Table 5: Introduction Teaching Session

		Demonstration	**Questioning technique**	**Sketching**
Demonstration	Pearson correlations	1	.848(**)	-.569 (**)
	Sig. (2-tailed)	.	.000	.001
	N	63	63	63
Questioning technique	Pearson correlations	.848 (**)	1	-.477(**)
	Sig. (2-tailed)	.000	.	.009
	N	63	63	63
Sketching	Pearson correlations	-.569(**)	-.477(**)	1
	Sig. (2-tailed)	.001	.009	.
	N	63	300	63

r=.85 shows strongly positive correlation between demonstration and questions technique
r=-.48 shows weak negative correlation between questions technique and sketching
r=-.56 shows medium negative correlation between demonstration and sketching

Table 6: DuringTeaching Session (Body)

		Small group monitoring	**Problem solution (trouble shooting)**	**Module guide**
Small group monitoring	Pearson correlations	1	.729(*)	-.379 (**)
	Sig. (2-tailed)	.	.000	.001
	N	63	63	63
Problem solution (trouble shooting)	Pearson correlations	.729 (*)	1	-.477(*)
	Sig. (2-tailed)	.019	.	.029
	N	63	63	63
Module guide	Pearson correlations	-.379(**)	-.477(*)	1
	Sig. (2-tailed)	.000	.019	.
	N	63	300	63

r=.73 shows strongly positive correlation between small group monitoring and problem solution
r=-.38 shows weak negative correlation between small group and module guide
r=-.48 shows weak negative correlation between module guide and problem solution

Table 7: During Teaching Session (Body)

		Teacher re-explain	Report writing	Summarize the task
Teacher re-explain	Pearson correlations	1	.729(**)	.634 (**)
	Sig. (2-tailed)	.	.000	.001
	N	63	63	63
Report writing	Pearson correlations	.729 (**)	1	.637(**)
	Sig. (2-tailed)	.000	.	.009
	N	63	300	63
Summarize the task	Pearson correlations	.634 (**)	.637(**)	1
	Sig. (2-tailed)	.001	.009	.
	N	63	63	63

r=.73 positive strong correlation between teacher re-explain and report writing
r=.64 medium positive correlation between teacher re-explain and summarize the task
r=.63 medium positive correlation summarize the task and report writing

ii) To investigate how teachers implement competency concepts in automotive practical work which contain knowledge and understanding, skills and attitudes, based on industrial experience.

Table 8: Teachers' background

Competency based concept	Teachers	N
Knowledge	Without industrial experience	7
	With industrial experience	17
Skills	Without industrial experience	7
	With industrial experience	17
Attitudes	Without industrial experience	7
	With industrial experience	17

Table 9 : Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Knowledge	Equal variances assumed	1.984	.173	-2.885	22	.009	-.40336	.13980	-.69330	-.11343
	Equal variances not assumed			-2.589	9.146	.029	-.40336	.15580	-.75495	-.05177
Skills	Equal variances assumed	.209	.652	.766	22	.452	.13085	.17073	-.22322	.48492
	Equal variances not assumed			.868	15.085	.399	.13085	.15075	-.19030	.45200
Attitudes	Equal variances assumed	.360	.554	.280	22	.782	.04622	.16526	-.29650	.38894
	Equal variances not assumed			.284	11.638	.781	.04622	.16264	-.30937	.40180

Applying knowledge shows that significant value is p< .05, skills; p>.05 and attitude; p>.05. From the significant level in can be concluded that there is a significant difference between experience in industries with applying knowledge in APW but no significant difference between experiences in industries with applying skills and attitudes in APW.

iii) To identify on how do students explore knowledge in automotive practical work based on knowledge and understanding, skills and attitudes?

MANOVA was used to determine the differences between students' achievement and how they satisfy their needs of exploring knowledge in automotives. There are three dependent variables: knowledge, skills and attitudes and independent variable is students' achievement.

Table 10 : Multivariate Test

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.997	1.0394	3.000	102.000	.000	.997
	Wilks' Lambda	.003	1.0394	3.000	102.000	.000	.997
	Hotelling's Trace	305.481	1.0394	3.000	102.000	.000	.997
GRED	Pillai's Trace	.081	1.445	6.000	206.000	.199	.040
	Wilks' Lambda	.920	1.444	6.000	204.000	.199	.041
	Hotelling's Trace	.086	1.442	6.000	202.000	.200	.041

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept + GRED

CONCLUSION AND DISCUSSIONS

Students in VET learn that students learned when something was done by teachers rather than as something they do by themselves. In practical subjects teachers conclude they should use demonstration method at the beginning followed by monitoring while students complete the task, giving comments or short conclusions at to what is right and wrong with their work. This is supported by Giere (1991) and Robin Millar (2004) who described the practical work by the figure. They relate the practical work in education and its uses in the job situation. Figure 1 illustrates the merger of VET learning and scientific practical work described by Giere and Robin. The figure was summarized from the teachers' preferences and students' preferences learning in VET.

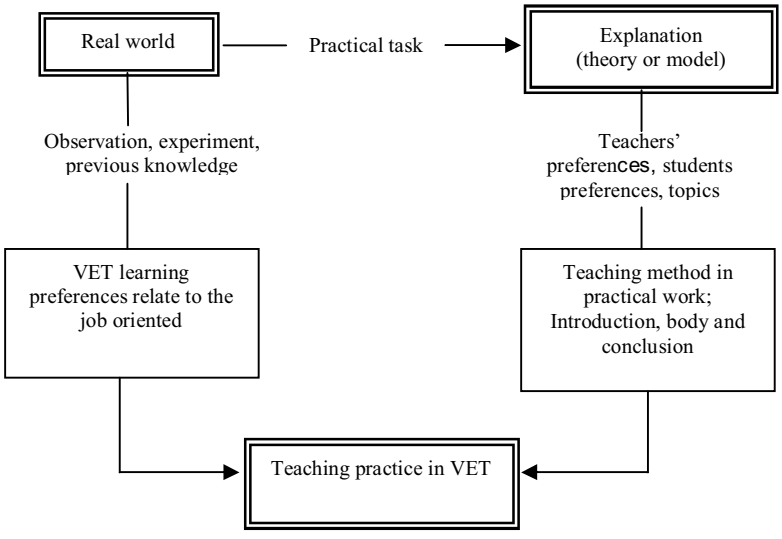

Figure 1: Teaching Practical Work Subject in VET

There are appropriate factors figured out in phase two between students' preferences and teachers' preferences in VTM-APW. Researcher illustrates in Figure 2 the comparison between two groups of respondents. The conclusion of VTM-APW if that the most common method used in introduction are demonstration (Demo) and questioning technique (QT), body of VTM-APW are group monitoring (GM) and problem solving (PS) and at the end of VTM-APW the methods are re-explain (R-ex) and report writing (RW).

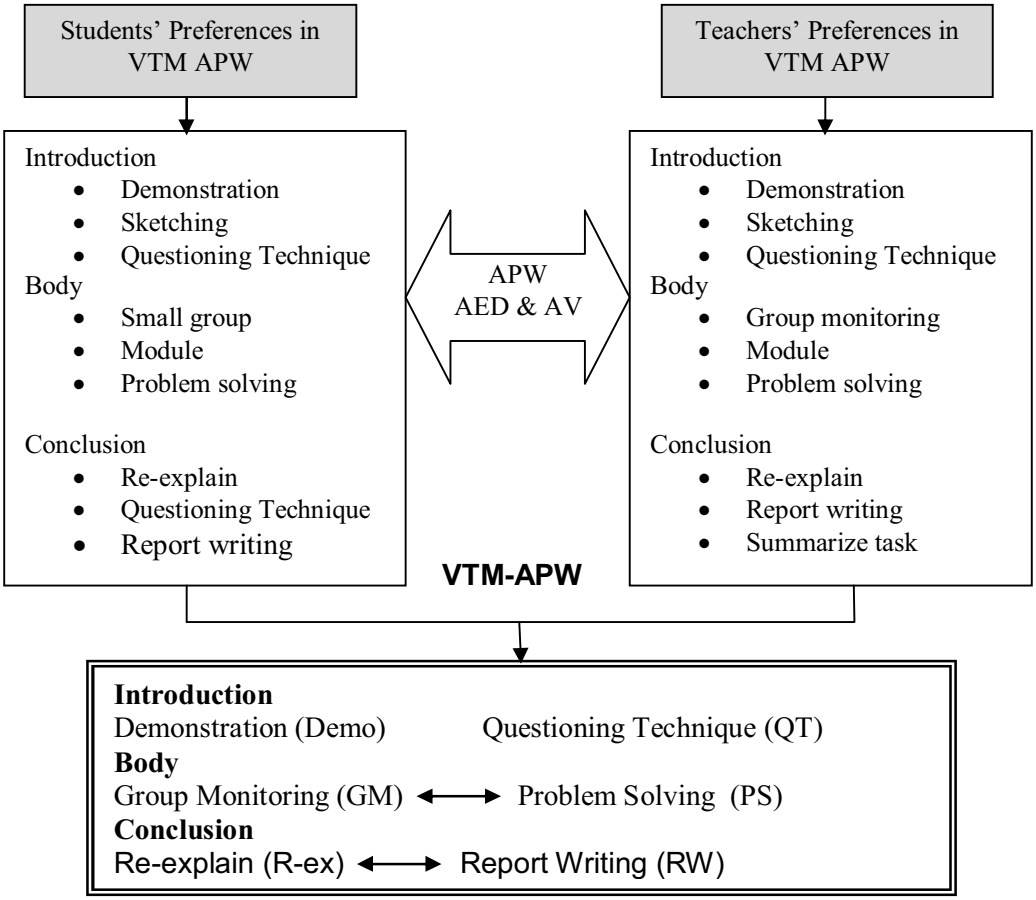

Figure 2: Students'-Teachers' Preferences in VTM-APW

In VTM practical work elements always merge with the knowledge and skills that teachers had. It fits with CBC and the findings of discussion before. Figure 3 points out the relationship between each element of CBC in VTM of APW. In practical task teachers should have the ability to integrate skills and knowledge, and at the same time they know the technology and current trends in automotives. Researcher proposed a circle where teachers and students should be aware of the important elements of automotive curriculum and new approaches of APW as shown in Figure 6.3. Attitudes covered the criteria of producing new ideas, discipline and ethics. Three main points in VTM-APW-CBC will be the strongest factors in teaching and learning automotives.

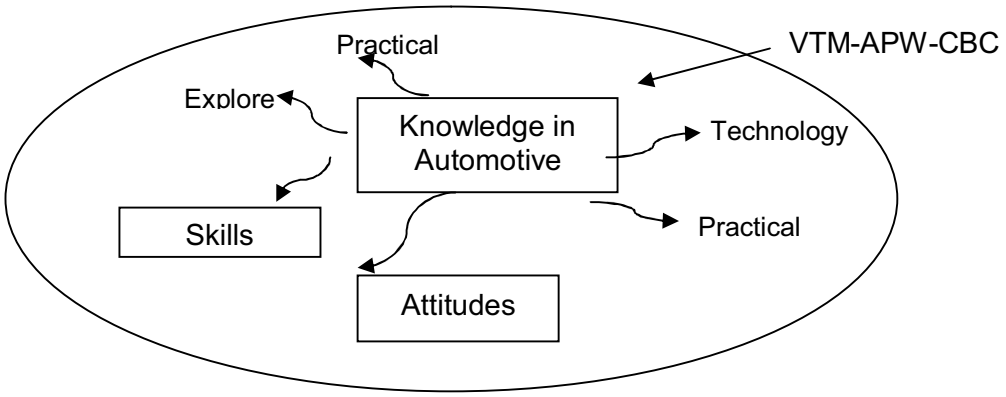

Figure 3: VTM with CBC in Exploring Knowledge

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