

CHAPTER 4

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RESEARCH FINDINGS

The total number of respondents for the study is 204 comprising 65 ex-trainees of Vehicle Mechanic Class 1 course (intermediate), 61 respondents from Vehicle Mechanic Class 2 (basic) and 78 supervisors who were in a position to evaluate ex-trainees.

Profile of Respondents

The profile of the respondents is as shown in Table 1.

Table 1: Demographic Profile of Respondents.

Demographic Variables	Number of Ex-trainees Class 1 No (%)	Number of Ex-trainees Class 2 No (%)	Number of Supervisor No (%)	Total No(%)
(a)	(b)	(c)	(d)	(e)
<u>Gender</u>				
Male	65 (31.86)	61 (29.90)	78 (38.24)	204(100)
Female	-	-	-	-
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
<u>Ethnic Group</u>				
Malay	63 (30.88)	57 (27.94)	77 (37.75)	197 (96.57)
Chinese	2 (0.98)	-	1 (0.49)	3 (1.47)
Indian	-	-	-	-
Others	-	4 (1.96)	-	4 (1.96)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
<u>Religion</u>				
Islam	65 (31.86)	59 (28.92)	77 (37.75)	201 (98.52)
Hindu	-	1 (0.49)	-	1 (0.49)
Christian	-	1 (0.49)	1 (0.49)	1.01
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)

(a)	(b)	(c)	(d)	(e)
Age				
18-25	17 (8.33)	31 (15.20)	10 (4.91)	58 (28.43)
26-30	24 (11.76)	30 (14.70)	19 (9.31)	73 (35.78)
31-35	21 (10.29)	-	19 (9.31)	40 (19.61)
36-40	2 (0.99)	-	22 (10.79)	24 (11.78)
Above 41	1 (0.49)	-	8 (3.92)	9 (4.41)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
Marital Status				
Single/Divorce	21 (10.29)	35 (17.16)	20 (9.81)	76 (37.26)
Married	44 (21.57)	26 (12.74)	58 (28.43)	128 (62.74)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
Education				
SRP/LCE	1 (0.49)	5 (2.45)	4 (1.96)	10 (4.91)
SPM/MCE	57 (27.94)	56 (27.45)	64 (31.37)	177 (86.75)
STPM/HSC	-	-	10 (4.91)	10 (4.91)
Certificate/Diploma	7 (3.43)	-	-	7 (3.43)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
Years of Service				
0-5	4 (1.96)	61 (29.90)	-	65 (31.86)
6-10	32 (15.69)	-	-	32 (15.69)
11-15	24 (11.76)	-	38 (18.63)	62 (30.39)
16-20	5 (2.45)	-	40 (19.61)	45 (22.06)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)
Rank				
Private to Corporal	65 (31.86)	61 (29.90)	39 (19.12)	165 (80.88)
Sergeant to Staff Sergeant	-	-	32 (15.69)	32 (15.69)
Warrant Officer 2	-	-	7 (3.43)	7 (3.43)
Total	65 (31.86)	61 (29.90)	78 (38.24)	204 (100)

All the respondents were male. Majority of the respondent were from the Malay ethnic group that constituted 96.57 percent and Islam is the main religion. There were two main age groups, they are the 18 to 25 years old group that made up 28.43 percent and the 26 to 30 years old age group that constituted 35.78 percent. The other age groups were 31 to 35 years old age group constituted 19.6 percent, while those above 41 years old age group made up 4.4 percent. The majority of the respondent (62.7 percent) were married while the remaining 37.3 percent of the respondents were single/divorced. Most of the respondents had education level of SPM/MCE (86.8 percent) whereas 4.9 percent had STPM/HSC and 3.4 percent had Certificate/Diploma. In terms of

years of service, 31.9 percent had less than five years of service, 15.7 percent served between six to ten years, 30.4 percent served between 11 to 15 years constitutes and the remaining 22 percent had between 16 to 20 years of service. The majority of the respondents were with the rank of Private and Corporal (80.9 percent). The rest of the respondents were Sergeant to Staff Sergeant that represented about 15.7 percent and Warrant Officer Class 2 constituted about 3.4 percent.

Evaluation On The Usefulness Of Course And Improvement in Knowledge And Skills After Training

Likert-type scale was used to find out the usefulness of the course and the improvement in knowledge and skills after training. The scale for usefulness was 1 for not useful at all, 2 for not useful, 3 for not sure, 4 for useful and 5, very useful. The scale for improvement in knowledge and skills after training were 1 for no improvement at all, 2 for little improvement, 3 for not sure, 4 for improved and 5 for great improvement. The respondents scores were then recorded and grouped into no/low usefulness, medium/high usefulness, no/low improvement and medium/high improvement by using percentile.

Usefulness of Course

Table 2 presents the findings on the usefulness of the courses. The respondents were asked to express their opinion on whether the course(s) they have attended is/are useful towards their daily work or tasks. Twenty two ex-trainees from the Vehicle Mechanic Class 1 said that the course is not useful or had very little usefulness while 43 respondents or 66.1 percent stated that the course was moderately to highly useful towards their daily work. The mean score was 64.75 with the standard deviation of 8.55.

For the Vehicle Mechanic Class 2 course, more of the respondents (44.3 percent) stated that the course was not useful while 55.7 percent responded that the course was of moderate to highly useful towards their daily work. Compared

with the Class 1, the percentage that reported the course as not useful is higher. The mean score was 50.11 and the standard deviation was 13.03.

The supervisors' views were also taken into account. Twenty four supervisors (30.8 percent) said that the courses was not useful or of very little useful to the ex-trainees while 54 or 69.2 percent said that the course was moderately to highly useful for carrying out their work.

It can be seen that more than one-third of the respondents rated the courses as not very useful. The possible reasons are:

- (1) limited opportunities to apply knowledge gained during course as most of the vehicles are on-the-road; and
- (2) restricted job enrichment resulting in limited scope for multi-job and hence, limiting the applicability of knowledge.

Table 2: Usefulness of Course Attended.

Group	No/Low Usefulness No (%)	Medium/High Usefulness No (%)	Total No (%)
Class 1	22 (33.8)	43 (66.1)	65 (100)
Class 2	27 (44.3)	34 (55.7)	61 (100)
Supervisor	24 (30.8)	54 (69.2)	78 (100)

Improvement in Knowledge and Skills

The respondents' views were also sought with regards to improvement in knowledge and skills. Only 38.5 percent or 25 respondents from the Class 1 stated that the course they have attended have not or have little improvement in their knowledge and skills after training while 61.5 percent respondents indicated that their level of knowledge and skills have moderately and highly increased after the training (Table 3). The mean score was 49.7 while the standard deviation was 13.03.

For the Class 2 respondents, 42.6 percent or 26 indicated that the course they have attended have not or have little improvement in their knowledge and skills. Meanwhile 35 respondents or 57.4 percent indicated that their level of

knowledge and skills have moderately to highly increased after the training. The mean score for Class 2 was 60.85 while the standard deviation was 5.8.

The supervisors' were also asked about the improvement in knowledge and skills of subordinates who have undergone training. Their responses were 87.2 percent or 68 supervisors stated that their subordinates have improved their level of knowledge and skills after training while 12.8 percent or 10 supervisors stated otherwise (Table 4). Further enquiries were done on their working attitude. Forty four supervisors stated that their subordinates working attitude has improved while 34 stated that they have not improved. The respondents responses in the no improvement or little improvement was probably due to the course(s) was not designed in-depth or the standard is low.

Table 3: Improvement in Knowledge and Skills (Ex-trainees).

Group	No/Low Improvement No (%)	Medium/High Improvement No (%)	Total No (%)
Class 1	25 (38.5)	40 (61.5)	65 (100)
Class 2	26 (42.6)	35 (57.4)	61 (100)

Table 4: Improvement in Knowledge, Skill and Working Attitude (Supervisors).

Factors	Yes No (%)	No No (%)	Total No (%)
Improvement in Knowledge and Skills	68 (87.2)	10 (12.8)	78 (100)
Improvement in Work Attitude	44 (56.4)	34 (43.6)	78 (100)

In order to understand the extent of the usefulness and the improvement in knowledge and skills after training, mean and standard deviation were used. The results are as shown in Table 5 (Class 1) and Table 6 (Class 2). Likert-type scale was used with 1 being not useful or no improvement at all up to 5, very useful or great improvement.

Table 5: Class 1 Course Syllabus Evaluation

Subjects	Usefulness		Improvement in knowledge and skills	
	Mean	SD	Mean	SD
(a)	(b)	(c)	(d)	(e)
1. To conduct component repair of an engine and fuel system.	4.78	0.41	3.91	1.25
2. To conduct repair on clutch, gear boxes and drive train system.	4.52	0.71	3.91	1.13
3. To conduct component repair of electrical systems.	4.48	0.62	3.55	1.26
4. Identify faults and repair of small 2 and 4 strokes machines.	4.45	0.73	3.20	1.26
5. Identify faults and repair of brake and hydraulic systems.	4.37	0.70	3.71	1.17
6. To conduct repair on cooling system, lubrication system, inlet and outlet and exhaust system.	4.34	0.82	3.14	1.50
7. Identify faults and repair of front and rear axle and chassis of vehicles.	4.12	0.80	3.25	1.08
8. To conduct wheel alignment and maintenance of wheels.	4.00	1.15	3.15	1.29
9. Identify faults and repair of all type of motorcycles.	3.97	0.71	2.94	1.26
10. To use and apply the knowledge of engineering science.	3.95	0.74	2.85	1.15
11. Identify faults and repair of out-board motors.	3.91	0.95	2.82	1.17
12. To draw and develop orthographic and isometric drawings.	3.62	1.01	2.88	1.10
13. Identify and repair of faults in tracked armoured vehicles (Stormer and Scorpion).	3.62	0.91	2.51	1.05
14. Identify and repair of faults in Condor Armoured Vehicles.	3.55	0.85	2.46	1.00
15. Identify and repair of faults in the Sibmas Armoured Vehicle.	3.55	0.85	2.46	1.05
16. To use and apply the knowledge of mathematics .	3.52	1.11	2.65	1.19

For subjects such as using and applying the knowledge of mathematics, engineering science and drawing, and developing orthographic and isometric

drawings, the mean for usefulness were 3.52, 3.95 and 3.62, respectively. In terms of knowledge and skills improvement after attending the course, the mean scores for the three areas were 2.65, 2.85 and 2.88, respectively. This shows that although the subjects taught found to be very useful, they did not really improve their knowledge and skills. The indicates that the standards of these subjects would have to be looked into so as to increase the level of knowledge and skills. Similarly, subjects on conducting component repair of an engine and fuel system, the mean for usefulness was 4.78 while the mean for the improvement in knowledge and skills was 3.91.

For identifying faults and repair of all type of motorcycles and out-board motors, the mean scores for the usefulness of the subjects were 3.97 and 3.91, respectively. In relation to improvement in knowledge and skills, the mean scores were 2.94 and 2.82. This indicates that the subjects taught were quite useful to the ex-trainees daily work but did not really improved their knowledge and skills.

In identifying and repairing of faults in Condor, Stormer, Scorpion and Sibmas Armoured Vehicles the mean scores for usefulness were 3.55, 3.62 and 3.55, respectively. The mean scores for the improvement in knowledge and skills of the ex-trainees were 2.46, 2.51 and 2.46. This shows that the subjects taught were quite useful to the ex-trainees daily work however they did not really improved their knowledge and skills.

Table 6: Class 2 Course Syllabus Evaluation

Subjects	Usefulness		Improvement in knowledge and skills	
	Mean	SD	Mean	SD
(a)	(b)	(c)	(d)	(e)
1. Identify faults and repair of brake systems in soft skin vehicles.	4.64	0.48	4.05	0.86
2. Identify faults and repair of clutch systems in soft skin vehicles.	4.52	0.50	4.31	0.87
3. Conduct workshop safety inspections and procedures.	4.46	0.72	4.02	0.87

(a)	(b)	(c)	(d)	(e)
4. Identify faults and repair of internal combustion engines.	4.80	0.40	3.49	1.42
5. Maintenance and inspection of soft skin vehicles.	4.49	0.65	3.61	1.46
6. Identify faults and repair of gear boxes in soft skin vehicles.	4.49	0.67	3.18	1.50
7. Identify faults and repair of fuel systems in soft skin vehicles.	4.43	0.62	3.28	1.36
8. Identify faults and repair of cooling systems in soft skin vehicles.	4.34	0.48	3.23	1.31
9. Identify faults and repair of electrical systems in soft skin vehicles.	4.31	0.79	3.44	0.79
10. Identify faults and repair of drive trains in soft skin vehicles.	4.16	0.64	3.59	0.69
11. Identify faults and repair of lubrication systems in soft skin vehicles.	4.13	0.74	3.80	0.77
12. Identify faults and repair of steering systems in soft skin vehicles.	4.10	1.15	3.25	1.43
13. Identify faults and align tyres of soft skin vehicles.	4.00	0.82	3.48	1.41
14. Identify faults and repair of suspension system in soft skin vehicles.	3.97	0.71	3.39	1.35

In the subjects such as identifying faults and repair of clutch systems and brake system in soft skin vehicles, and conduct workshop safety inspections and procedures the mean scores for the usefulness were 4.52, 4.64 and 4.46, respectively. The mean scores for improvement in knowledge and skills were 4.31, 4.05 and 4.02. This indicates that the subjects taught were useful to the ex-trainees' daily work and have improved their knowledge and skills.

For subjects such as identifying faults and repair of steering systems, gear boxes, cooling systems, and fuel systems, the mean scores for the usefulness were 4.10, 4.49, 4.34 and 4.43, respectively. In terms of improvement in knowledge and skills, the mean scores were 3.25, 3.18, 3.23 and 3.28, respectively. This indicates that the subjects taught were useful to the ex-trainees' daily work however it moderately improved their knowledge and skills.

For the subject of identifying faults and repair of suspension system, the mean score for usefulness was 3.97 and the mean score for improvement in

knowledge and skills was 3.39. This indicates that the subject taught was of moderate use to the ex-trainees and also moderately improved their knowledge and skills.

Analysis and Evaluation of External Validation in General

Information was gathered to find out the extent of the implementation of external validation. The ex-trainees were asked how many courses have they attended throughout their entire service. Both ex-trainees and supervisors were also asked whether they have been asked to evaluate any courses in the capacity as ex-trainees and supervisors. The responses from the ex-trainees and their supervisors are as shown in Table 7 and Table 8, respectively.

Table 7: Number of Courses Attended for Ex-Trainees.

Group	Number of courses attended	
	0 - 5 No (%)	6 - 10 No (%)
Class 1	62 (95.4)	3 (4.6)
Class 2	54 (88.5)	7 (11.5)

Table 8: Validation of Courses.

Group	Yes No (%)	No No (%)
Class 1	24 (36.9)	41 (63.1)
Class 2	26 (42.6)	35 (57.4)
Supervisors	26 (33.3)	52 (66.7)

From Table 7, most of the ex-trainees (Class 1 and Class 2) have attended less than five courses throughout their service. In Table 8, only 36.9 percent or 24 respondents from the Class 1 course indicated that external validation has been conducted while for the Class 2, only 26 respondents or 42.6 percent indicated that they were exposed to external validation. The supervisors' responses indicated that only 33.3 percent have externally validated the courses

attended by their subordinates. This indicates that external validation is not being fully implemented.

Analysis and Evaluation of External Validation for the Class 1 and Class 2 Course

The process of external validation basically starts with observations by supervisors, followed by administering questionnaires on ex-trainees and finally, interviews by the respective Training Development Officers or the staffs from the Training Cell or Curriculum Cell of the training institutions were conducted.

Post-Course Observation

The ex-trainees were asked whether they knew that they were being observed on their skills, knowledge and working efficiency by their supervisors after the completion of their respective courses. The Class 1 ex-trainees responses were 28 respondents or 43.1 percent knew about the matter while for the Class 2 only 44.3 percent or 27 respondents knew about the matter.

The supervisors were also asked on whether they knew that they were supposed to observe and evaluate their subordinates for at least six months after they have completed their respective courses. The supervisors' responses were: about 26.9 percent or 21 supervisors knew about it whereas 73.1 percent stated that they did not know about the matter.

Responses from all the respondents indicated that awareness of external validation process is low and it is hardly conducted. Responses from the supervisors indicated that they actually did not know that they were supposed to observe their subordinates for at least six months immediately after completion of their respective courses. This may be probably due to no thorough knowledge on the training system or they simply did not know about it or communication breakdown or they did not have the time or resources to conduct it. The responses can be seen in Table 9.

Table 9: Post-Course Observation

Group	Yes No (%)	No No (%)	Total No (%)
Class 1	28 (43.1)	37 (56.9)	65 (100)
Class 2	27 (44.3)	34 (55.7)	61 (100)
Supervisors	21 (26.9)	57 (73.1)	78 (100)

Post-Course Evaluation

The ex-trainees from both courses were asked whether they were directed to evaluate the courses after they were posted to their working place or units. For the Class 1 course, about 41.5 percent of the respondents said that they were asked to evaluate the course whereas 58.5 percent said that they were not asked. For the Class 2 course, about 49.2 percent said that they were asked to evaluate the course whereas 50.8 percent said that they were not asked. The supervisors were also asked the same question pertaining to the evaluation of their staff, about 39.7 percent of the supervisors responded that they were asked to evaluate the courses their subordinates have attended while 60.3 percent replied they were not asked to do so. Their responses can be seen in Table 10 below. From all their responses, it seems that at least more than 50 percent of the respondents were not asked to evaluate the courses they have attended or their subordinates have attended. This indicate clearly that external validation was not fully executed.

Table 10: Post-Course Evaluation.

Group	Yes No (%)	No No (%)	Total No (%)
Class 1	27 (41.5)	38 (58.5)	65 (100)
Class 2	30 (49.2)	31 (50.8)	61 (100)
Supervisors	31 (39.7)	47 (60.3)	78 (100)

Post-Course Interviews

The ex-trainees were also asked whether they were interviewed and asked about the courses they have attended after they have reported to their respective working places or units. For the Class 1 ex-trainees, about 52.3 percent or 34 respondents indicated that they were interviewed and asked about the courses they have attended after they have reported to their working places or units while for the Class 2 about 60.7 percent or 37 respondents indicated that they were interviewed.

The supervisors were also asked whether they were interviewed by personnel from the Curriculum Cell from the Army Institute of Engineering or staffs from the Training Cell of the Royal Electrical and Mechanical Engineering Directorate on courses that their subordinates have attended. The responses from the supervisors were: about 26.9 percent said that they were interviewed 73.1 percent said otherwise.

The interview attended by the ex-trainees was probably the walk-in interview to their respective working places or units by the management and not external validation interviews. This can be counter-check with the responses given by the supervisors because most of them were not interviewed by the appropriate departments that should be conducting the external validation. The responses from the ex-trainees can be seen in Table 11. This indicates that external validation (i.e. interviews after the observation and evaluation process) is not being fully conducted.

Table 11: Post-Course Interviews.

Group	Yes (%)	No (%)	Total (%)
Ex-trainees (intermediate course)	56.3	43.7	100
Ex-trainees (basic course)	60.7	39.3	100
Supervisors	26.9	73.1	100

Course Performance

The supervisors were also asked on whether both the Class 1 and Class 2 courses have met the current working or job requirement. Their responses can be seen in Table 12.

Table 12: Supervisors' Evaluation on Performance after Completion of Course.

Course	Meet current job requirement	Unable to meet current job requirement	Total
	No (%)	No (%)	No (%)
Class 1	43 (55.1)	35 (44.9)	78 (100)
Class 2	48 (61.5)	30 (38.5)	78 (100)

More than 50 percent of the supervisors agreed that both courses have prepared the ex-trainees for their current job requirement. However, in relation to the usefulness and increase of knowledge and skills discussed earlier, there are certain subjects in the Class 1 and Class 2 courses that needed to be looked into or revised.

Suggested Improvements for Class 1 and Class 2 Courses

All the respondents were asked to state the subjects that needed to be added or dropped from the respective courses. For the Class 1 course, about 43.1 percent or 28 respondents indicated that there are several subjects that needed to be dropped. They are mathematics, engineering science and technical drawing. Thirty two respondents (49.2 percent) indicated that there are subject(s) to be added. Most of the respondents indicated that subject on repair and maintenance of electronic fuel injector should be included.

For Class 2 course, the responses were: 49.2 percent or 30 respondents agreed that there are subject(s) to be dropped while 39.3 percent indicated that there are subject(s) to be added. However, the respondents did not indicate the

subject(s) to be dropped or added. They all seemed to agree that the theoretical classes should be shortened and more practical work should be conducted.

The supervisors were also asked about what subjects to be dropped or added for the Class 1 and Class 2 courses. Generally, all supervisors stated the subject on repair and maintenance of electronic fuel injector needed to be included in both courses and more practical work and exercises needed to be conducted on each subject.

Interviews

Interviews were conducted with the Chief Instructor and staffs of the Curriculum Cell from the Army Institute of Engineering on 7 September 2000. The main focus of the interview was on the conduct of external validation. The interview revealed that the Chief Instructor and the staff at the Curriculum do not have any feedback on whether the ex-trainees are trained enough for them to do their job. It was also found out that there is no external validation planning and schedule. Thus far, none of the courses conducted at the institute have been externally validated. All the courses conducted are internally validated.

Interviews were also conducted with the instructors from the Training and Development at the Army Institute of Management. Several reasons were identified through the interview as to why external validation were not totally carried out in the training system. Some of the reasons stated were: lack of knowledge on how to conduct external validation, if it was conducted the data collected were not interpreted, budget constraint and the bureaucracy of changing the nature of courses (i.e. course duration or content).