CHAPTER III

RESEARCH DESIGN, INSTRUMENTATION AND PROCEDURES

3.0 Introduction

This study is a survey research designed to obtain research evidence concerning the attitude of school administrators and teachers teaching Physical Education toward Physical Education and to examine the implementation of the Physical Education programme in secondary school in Peninsular Malaysia.

The Wear's Physical Education Attitude theoretical model served as the basis for studying attitude towards Physical Education while three questionnaires were developed to study the implementation of the Physical Education programme in schools.

To ensure that useful and reliable data were collected, certain procedures were considered necessary in the selection of the sample population and in the formulation of the questionnaires. These procedures were strictly adhered to during the entire course of the study.

This chapter presents the methods and procedures that were adhered to in conducting this study. The details are presented under following headings:

a. Conceptual framework
b. Research Design
c. Sampling
d. Instrumentation
e. Pilot study

f. Procedures

g. Data collection and data analysis

3.1 Conceptual Framework

The overall framework provided the basis for this research on the attitude towards Physical Education and the implementation of the Physical Education programme in secondary schools. This study would raise a number of very important points concerning both our understanding of these three classes of variables (attitude, human and non-human, demographic) and to obtain some evidence of the contribution made to effectiveness by different aspects of the teaching of Physical Education in secondary school.

Even though the framework chose not to highlight three variables of effective teaching : context variables, process variables and product variables (Kyriacon, 1988), all the variables were implicitly considered especially the context and process variables.

The conceptual framework of this study is a composite of a schematic conception of attitude and factors of the implementation of the Physical Education programme (Figure 3.1). The conception of attitude is based on the Rosenberg and Hovland (1960) model (Figure 3.2), which deals with the relationship of three domains that is affective, cognitive and conative/ behavioural. The conceptual framework for the implementation of the Physical Education programme is based on two factors that is human factors and non-human factors (Figure 3.3). These two factors were noted by Malaysian researchers Siow Heng Loke & Wong Heng Hun (1983), Asmah Ahmad (1989) and Jamil Ahmad (1992) to be important factors in the implementation of the secondary school

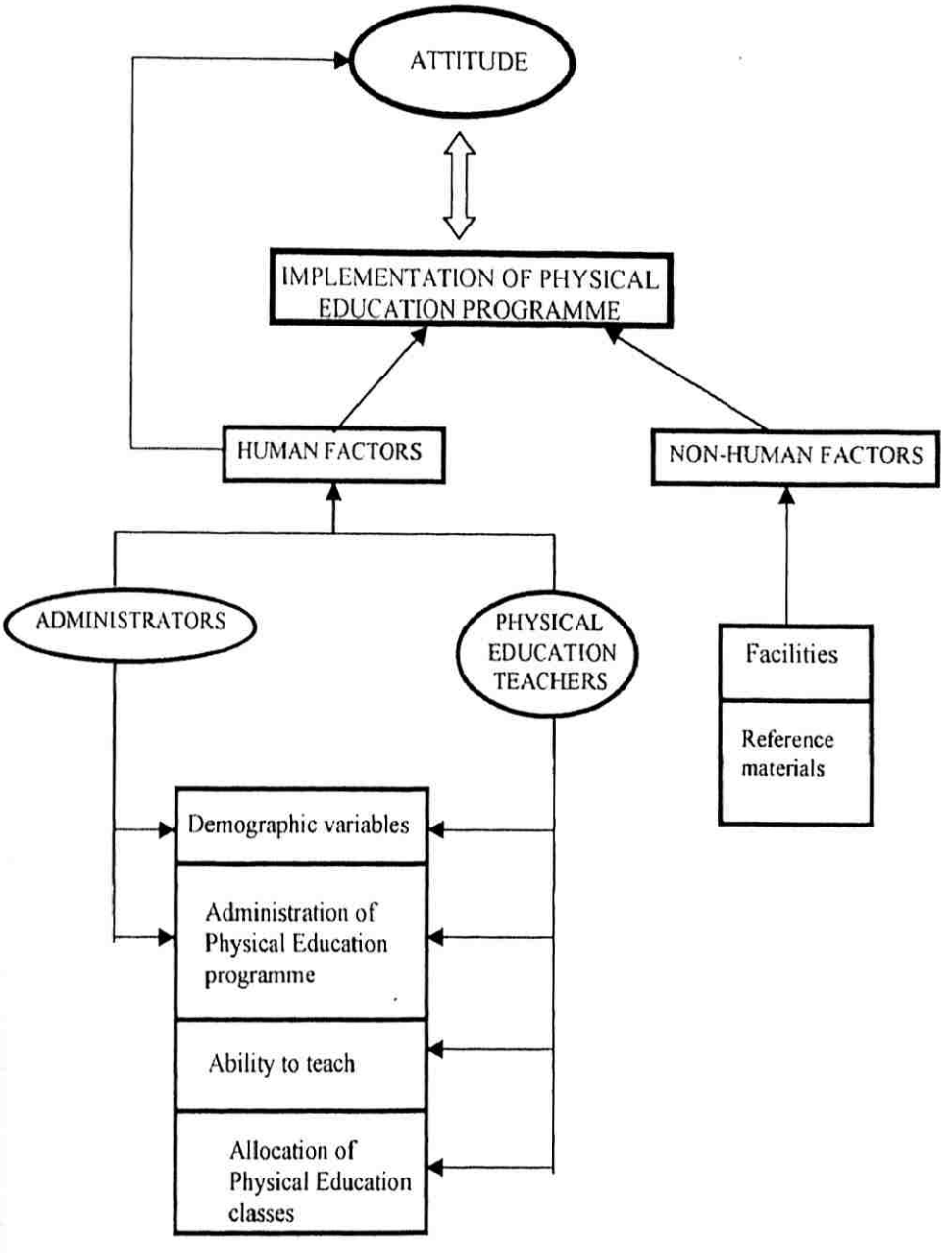

Figure 3.1 Conceptual Model Of The Attitude Towards Physical Education And The Implementation Of Physical Education Programme

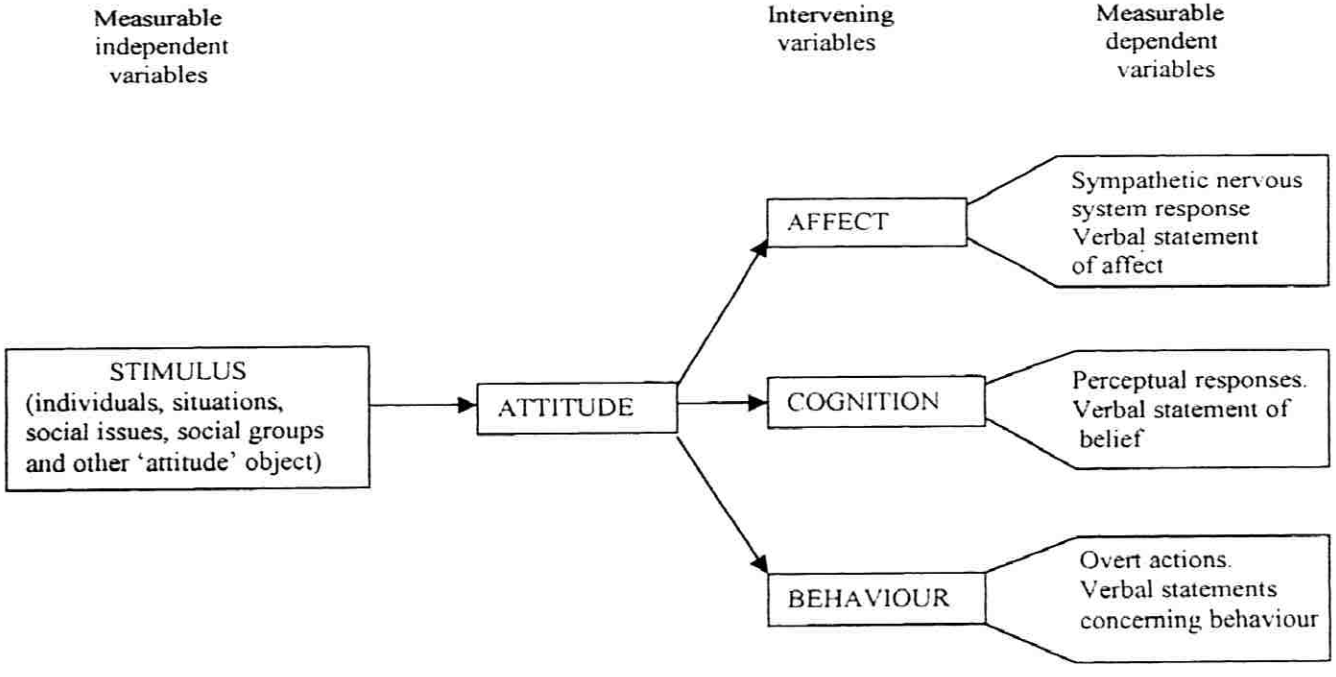

Figure 3.2 A schematic conception of attitudes

Source: Eiser, J.R. (1986). Social psychology: Attitudes, cognition and social behaviour. Cambridge, Cambridge University Press. P.54

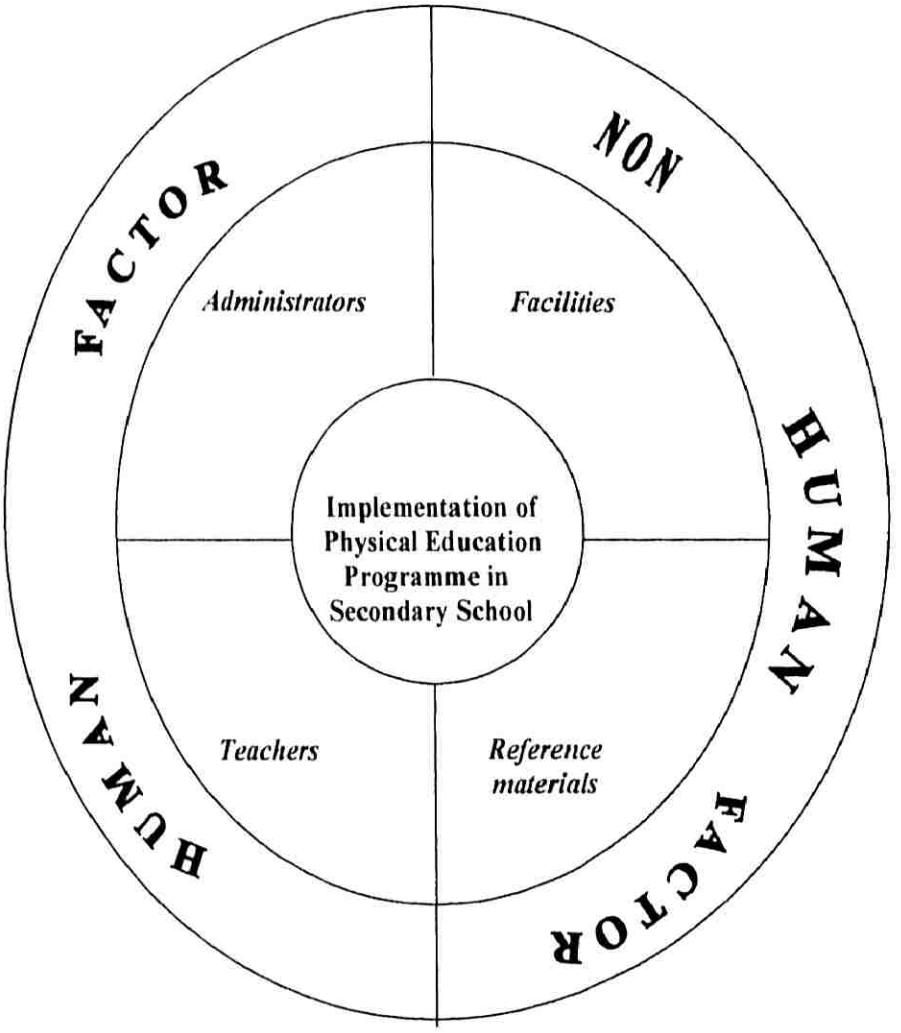

Figure 3.3 Model of factors affecting the implementation of Physical Education programme in secondary school

curriculum in the Malaysian context. Similar to Lutterdolt (1980), Siow Heng Loke & Wong Heng Hun (1983) stressed that resources influence the implementation of the school curriculum. Lutterdolt (1980) divided resources into two categories, that is human factors and non-human factors.

The human factors include administrators, teachers and other staff. The non-human factors are rooms or space, facilities and equipment as well as reference books. In this study the human factors comprised of three components: administration of the Physical Education programme, teaching ability and Physical Education class distribution. The non-human factors are divided into facilities and reference materials.

The model in Figure 3.1 (p.112) shows that attitude and implementation factors (human and non-human) played important roles in the implementation of the Physical Education programme in secondary schools. Attitude of administrators and teachers is equally important to determine the successful implementation of a Physical Education programme in school. The human factors focus on administrators and Physical Education teachers who in turn influence other variables such as the administration of the Physical Education programme, the ability to teach and the allocation of Physical Education classes as well as demographic variables. Concurrently the non-human factors relate to facilities and reference materials.

In considering the attitude variables, it is undoubtedly agreed by many researchers that the four dimensions of attitude which can be combined in a variety of ways contribute substantially towards the successful implementation of the Physical Education programme in schools. It is also imperative for us to understand that the attitude is very much influenced by context and process variables. In addition it is also very much related to demographic variables. Clearly the enormous influence of context, process and demographic variables create problems for research. It means that each

research undertaken can only take into account a few aspects of those variables at any one time. However, the presence of a variable or an aspect of a variable can have a different influence on the implementation of Physical Education programme in school.

In considering the implementation factors (human and non-human factors), this research focused on the perception of Physical Education teachers in order to understand their behaviour and how context variables affect them in the implementation of physical education programme. This research looks at four dimensions of the implementation of Physical Education programme that is teaching ability, the administration of Physical Education, Physical Education class distribution and facilities and reference materials. These dimensions which were endorsed by the panel of experts (Appendix J) are very relevant in the Malaysian context. Thus, in looking at these dimensions, there is a need to consider and take into account how the four dimensions of the Physical Education programme implementation influence each other and not attempt to see each dimensions in isolation. Further, it is imperative to also be reminded about the relationship between those dimensions and the attitude of Physical Education teachers towards Physical Education.

In this study, the demographic variables include age, sex, race, academic qualification, professional qualification, area of specialisation, teaching experience, school grade, school location, number of teaching staff and teaching work load.

3.2 Research Design

The design of this study can be categorised as 'Ex post facto' design (Best, 1970; Kerlinger 1973). According to Kerlinger (1973, p. 317) an ex post facto research is " ... a research one cannot manipulate or assign subjects or treatments because the

independent variable or variables have already occured, so to speak. The investigator starts with observation of the dependent variable and retrospectively studies independent variables for their possible effects on the dependable variable". Best (1970) stated that an ex post facto research is a research that studies factor or factors as they relate to each other. The dependent variable of major interest in this study is attitude in terms of the perceived meaning of Physical Education with four independent variables related to attitude.

The design includes two survey groups, that is administrators (principals, senior assistants) and teachers teaching Physical Education. The sample population consists of one principal, one senior assistant and all teachers teaching Physical Education from each of the schools selected.

3.3 Sampling

This study was carried out in selected secondary schools in Peninsular Malaysia. The schools selected are all government aided secondary schools and they offer the same secondary curriculum which is prepared by the Curriculum Development Centre, Ministry of Education, Malaysia.

The target population for this study includes administrators (principals and senior assistant) and teachers teaching Physical Education from randomly selected schools. A total of 290 schools were selected. Stratified sampling was used to determine the sample subjects for this study.

The sample size from the twelve states of Peninsular Malaysia were determined based on the school lists (10 September 1997) published by the Educational Planning and Policy Research Division, Ministry of Education, Malaysia.

The above-mentioned method is used to select a sample of 290 schools from a total of schools tabulated in Table 3.2. This sample size of 290 schools is 23.3% of the total number of secondary schools in Peninsular Malaysia. This sample size is considered adequate at the 95% confidence level with results within 5% of the true percentage in the population (Mitchell & Jolley, 1996. See Appendix B). The sample population of 290 schools includes a total of 3156 subjects that is, 290 principals, 290 senior assistants and 2576 Physical Education teachers.

3.4 Instrumentation

For the purpose of gathering data in this study, four instruments were administered to the 290 schools. The Wear Physical Education Attitude Inventory (WPEAI) (Form A) (Wear, 1955, Appendix D) was adopted while three separate questionnaires for the implementation of physical education programme were designed by the researcher for the study (See Appendix E, F & G). The WPEAI is for the principals, senior assistants and teachers teaching Physical Education. Each of the other three questionnaires were specifically for principals (Appendix E), senior assistants (Appendix F) and teachers teaching Physical Education (Appendix G).

In selecting an instrument to assess attitude towards Physical Education, past studies in the field of Physical Education and physical activity were reviewed. The studies revealed that a number of attitude scales have been published by several Physical Education teachers and exercise specialists (Adams, 1963; Carr, 1945; Edington, 1968; Kappes, 1954; Kneer, 1971; Mercer, 1971; O'Bryan & O'Bryan, 1979; Penmon, 1971; Seaman, 1970, Wear 1951, 1955). However, the WPEAI has been selected because it is a carefully prepared instrument and has been used repeatedly by many researchers to evaluate attitudes toward Physical Education. To date not less than

38 researchers (Amos, 1977; Berger & Layne, 1969; Birmingham, 1972; Broer & Ind, 1954; Brumbach, 1968; Brumbach & Cross, 1965; Campbell, 1968; Cheek, 1971; Corbin & Chevrette, 1974; Cross, 1968; Davis, 1964; DeVrye, 1973; Everts, 1968; Johnson, 1972; Kee, 1995; Keogh, 1962, 1963; Layne, 1969; Lockhart, 1972; Marburger, 1966; Miller, 1974; Moyer, Mitchem & Bell, 1966; Murphy, 1973; Murray, 1969; Organ, 1973; Rainbolt, 1971; Spasott, 1971; Vincent, 1967; Wessel & Nelson, 1964; Williams & Nelson, 1983; Williams & O'Neill, 1983; Yandell, 1966; Zafra, 1971) have used this instrument.

3.4.1 Wear Physical Education Attitude Inventory Short Form A

The Wear Physical Education Attitude Inventory was constructed by Carlos L. Wear in 1951. The instrument contains 120 statements which are believed to be related to the outcomes which result from a well-conducted and well-balanced programme of Physical Education. Later, the instrument was revised and several statements were dropped and a few new ones added. These statements were reduced to a list of 40, which became the short form of the inventory. In 1955, Wear constructed an alternate short forms of scale which reduced the total statements from 40 to 30 and this is called Short Form A.

The inventory is divided into four categories and each contains attitude statements towards Physical Education. The four categories are as follows:

i) physiological-physical	:	six statements
ii) mental-emotional	:	seven statements
iii) social	:	eight statements
iv) general	:	nine statement

Approximately half of the statements were worded negatively; they were scored in .

reverse from five to one (Appendix D). The sum of the 30 items provides an indication of a subject's attitude towards Physical Education. A maximum score of 150 points would indicate a very strong favourable attitude towards Physical Education and minimum score of 30 points would indicate otherwise. A score of 90 points would reflect a neutral response.

3.4.1.1 Validity and Reliability of Wear's Physical Education Attitude Inventory (Form A)

The content validity of this inventory has been accepted by Brumbach & Cross (1965), Campbell (1968), Keogh (1962), Vincent (1967), and Wear (1955). Wear (1955) validated the inventory on 100 male subjects at the State University of Iowa and provided a mean of 114.59 and standard deviation of 17.24. The reliability of the inventory, calculated by using the split-halves technique and Spearman-Brown formula was +.94. Keogh (1962) administered the inventory to 136 men and 130 females at UCLA and obtained a mean and standard deviation of 113.5 and 15.5 for the men and 112.9 and 17.9 for women. Keogh used the Kolmogorov-Smirnov two-sample technique to validate the inventory. Vincent (1967) validated the inventory on 188 college women and obtained a mean score of 114.72 and standard deviation of 14.82. Brumbach & Cross (1965) obtained a mean score of 119.72 and standard deviation of 12.93 when they administered the inventory on 938 freshman males at the University of Oregon. Campbell (1968) employed a biserial coefficient of correlation item analysis procedure to compare the distribution of item scores to the total score as well as the item score to the category score. He found that all the items of the inventory correlated significantly with the total score and that the item score also had a significant correlation with the inventory category score.

In Malaysia, the same inventory has been validated by Kee (1995), collaborated by a panel of experts from various field in Malaysia. The Wear's inventory was first translated by Kee from English into Bahasa Malaysia, the medium of instruction in Malaysia. For the purpose of revalidation, a panel of three translators were asked to translate the items of the instrument independently. The items were then compared and the version of each item agreed to by at least two of the panel members was chosen for inclusion in the Bahasa Malaysia version of the instrument.

Kee (1995) used the test-retest method to determine the reliability of the Wear's inventory. The process involved 30 pre-service teachers. The retest was carried out after a week. A Pearson Product-Moment correlation technique was used and the r-value for the total score was +.80.

3.4.2 The Questionnaire On The Implementation of Physical Education Programme

In order to gather data on the implementation of Physical Education programme in schools, three questionnaires, one each for principals, senior assistants and teachers teaching Physical Education were constructed. The preparation of the questionnaires involved the following stages:

i. Preliminary study of related questionnaires and materials and translation of the questionnaires into Bahasa Malaysia;
ii. Advice from a panel of experts;
iii. Modification of the questionnaires and its translation;
iv. Pilot study of the questionnaires

Prior to preparing the questionnaires a preliminary study was conducted to find out the relevant items for the questionnaires. The following theses and materials were reviewed:

1. Malaysia Ministry of Education (1982). Reports on the teaching of Physical Education in schools in the Klang District, Selangor. Kuala Lumpur : Federal Inspectorate of Schools.
2. Ministry of Education Malaysia (1990). Study on the implementation of Physical Education programme in selected secondary schools. Kuala Lumpur : Curriculum Development Centre.
3. Ministry of Education Malaysia (1993). Monitoring Reports on the teaching of Physical and Health Education . Kuala Lumpur : Curriculum Development Centre.
4. Ministry of Education Malaysia (1995). Status Report On Physical and Health Education In Secondary Schools. Kuala Lumpur : Federal Inspectorate of Schools.
5. Sakhiyah Abdul Manaf (1997). Teachers perceptions of the role of principals in staff development: study of secondary schools in Klang District, Selangor. Unpublished Graduate Exercise, University of Malaya.
6. Indra Devi, S.S (1992). Perceptions of selected trainees of the primary school teacher education programme in Malaysian Teacher Training Colleges. M. Ed. thesis, University of Malaya.
7. Graham, K.L. (1996). Running Ahead Enhancing Teacher Commitment. Journal of Physical Education, Recreation & Dance, 67(1), October, 45-47.
8. Sallis, J.F., McKenzie, T.L., Kolody, B. & Curtis, P. (1996). Assessing District Administrator's Perceptions of Elementary School Physical Education. Journal of Physical Education, Recreation & Dance, 67(8), October, 25-29.

9. Rink, J. (1997). Teacher Education Programs: The Role of Context in Learning How to teach. Journal of Physical Education, Recreation & Dance, 68(1), January, 17-19, 24.

10. Hansen, H. (1990). Barriers to QDPE and how to overcome them. CAHPER JOURNAL, March/April, 16-21.

11. Grant, B. (1990). Influences on Physical Education and those who teach it. CAHPER JOURNAL, March/April, 4 - 9.

12. Jamil Ahmad (1992). A Study of The Constraints In The Implementation of KBSM Science In Secondary Schools In The State Of Kedah Darul Aman (Translation). M. Ed. thesis, National University Of Malaysia.

The questionnaires were then translated into Bahasa Malaysia. The problem of equivalence in the translation of the instrument developed in one culture and used in another (Sechrest, Fay & Zaidi, 1972) is noted and as such the translation of the instruments in this study followed procedures that were recommended by Hulin, Dragon and Parsons (1983). The questionnaires were first translated into Bahasa Malaysia by a language expert who is proficient in both English and Bahasa Malaysia. The translated questionnaires were then translated back from Bahasa Malaysia to English by another competent language teacher. A third language teacher checked the back translated questionnaires with the original questionnaires. Finally, both the English and Bahasa Malaysia versions of the questionnaires were scrutinised by two expert panel members who are proficient in both languages..

A preliminary study of the questionnaires was conducted in a secondary school and in the Language Institute (Teacher Training College) to find out the relevancy of the items. Five participants were interviewed . At the same time the advice from a panel of eight experts in the field of Physical Education and education (see Appendix J for the panel) was sought to ascertain the appropriateness of the items in the

questionnaires for the Malaysian secondary schools respondent. The findings of the preliminary study revealed that some items were not suitable and some terms or words were difficult to understand. An explanation was given in bracket for difficult terminology.

3.4.2.1 Questionnaire for principals

The questionnaire is divided into three sections.

Section A : Personal Data

This section consists of 8 items. The items relate to the age, sex, marital status, race, academic qualification, professional qualification, field of specialisation and working experience of respondents.

Section B : School background information

This section contains 4 items related to school background. The items are to gather information on grade of school, location of school and facilities for Physical Education and equipment for Physical Education classes.

Section C : Information on implementation of Physical Education Programme

The items in this section relate to information on the implementation of Physical Education programmes in school. There are 6 items in this section. The questions solicit information on assignment of teachers and criteria used to assign teachers to teach Physical Education, observation and evaluation of teachers and the use of Physical Education periods for other academic subjects.

3.4.2.2 Questionnaire for senior assistants

There are three sections in this questionnaire.

Section A : Personal data

This section consists of 8 items. The items relate to the age, sex, marital status, race academic qualification, professional qualification, field of specialisation and working experience of respondents.

Section B : School background information

This section is concerned with teaching staff. Questions pertaining to the number of teachers in school and number of teachers assigned to teach Physical Education. Other questions relate to the subjects options of Physical Education teachers.

Section C : Information on implementation of Physical Education programme

This section contains 7 items related to how the Physical Education programme is implemented in school. The questions solicit information on the assignment of teachers to teach Physical Education, observation of teachers teaching Physical Education, how Physical Education periods are used and in-house training of Physical Education teachers.

3.4.2.3 Questionnaire for teachers teaching Physical Education

The questionnaire is divided into three sections.

Section A : Personal Data

This section consists of 11 items. The items relate to age of respondent, sex, marital

status, race, academic qualification, professional qualification, field of specialisation and working experience, teaching work load, practical teaching experience of respondents and his ability to teach Physical Education.

Section B : School background information

This section contains 2 items related to the facilities and equipment.for Physical Education classes.

Section C : Information on implementation of Physical Education programme

This section consists of 6 items. Two items relate to the allocation of Physical Education classes and administration of Physical Education programme. One item focuses on the problems faced by teacher teaching Physical Education. From a list of 5 problems, the respondents are asked to identify those faced by them while teaching Physical Education in schools. They are required to state the degree of seriousness from a 5-point Likert scale ranging from 'Very Serious' to 'Not Very Serious'. The other three items relate to the Physical Education committee in schools, in-house training programmes and Physical Education and sport related courses attended from various agencies.

3.5 Pilot Study

3.5.1 Introduction

The pilot study was conducted in 30 secondary schools (Appendix N). These schools were selected so that they would represent schools from four different zones (See Table 3.1) in Peninsular Malaysia. A total of 90 respondents were selected. They

constituted 30 principals, 30 senior assistants and 30 Physical Education teachers.

Table 3.1

PILOT SAMPLING OF SECONDARY SCHOOLS IN PENINSULAR MALAYSIA

ZONE	STATE	NUMBER OF SCHOOLS
NORTH	1. KEDAH	2
CENTRAL	2. PERAK	1
	3. SELANGOR	1
	4. FEDERAL TERRITORY	19
SOUTH	5. NEGRI SEMBILAN	2
EAST	6. KELANTAN	4
	7. PAHANG	1
TOTAL		30

This pilot study was carried out in June and July 1998. It was conducted to test the reliability and validity of the two instruments, that is the Wear Physical Education Attitude Inventory (WPEAI) and the Implementation of Physical Education Programme (IOPEP). A factor analysis was run to determine the four dimensions of the implementation of Physical Education programme. Table 3.2 shows the profiles of the respondents.

The respondents were also asked to comment on the clarity of the items in the questionnaires and to offer suggestions to make those items clear. Based on the feedback received from the respondents, appropriate changes were made to some items in the questionnaires. As a result of suggestions from the pilot study, each question in the Wear inventory was printed out in two languages for the respondents.

Table 3.2

The Profiles Of The Respondents Of The Pilot Study (N = 90)

Variable	*Frequency*	*Percentage*
1. **Respondent**		
Principal	30	33.3
Vice-principal	30	33.3
P.E. Teacher	30	33.3
2. **Sex**		
Male	47	52.2
Female	43	47.8
3. **Age**		
30 years and below	10	11.1
30 – 39	21	23.3
40 – 49	37	41.1
50 and above	22	24.5
4. **Academic Qualification**		
SPM / MCE / SPMV	5	5.6
STPM / HSC	4	4.4
Diploma	1	1.1
First Degree	75	83.3
Master	5	5.6
5. **Professional Qualification**		
Teaching Certificate	12	40.0
Diploma in Education	18	60.0
6. **Major**		
Physical & Health Education	3	3.3
Language	34	37.8
Art & / or Music	2	2.2
Mathematics & / or Science	20	22.2
Religious Studies	3	3.3
Others	28	31.2
7. **School Location**		
Urban	23	76.7
Rural	7	23.3
8. **School Grade**		
Grade A	19	63.3
Grade B	11	36.7
9. Teaching Experience		
Below 5 years	14	15.5
5 – 9	6	6.7
10 – 14	9	10.0
15 – 19	26	28.9
20 and above	35	38.9

3.5.2 Results Of Analyses On The Reliability and Validity of the Intruments

Validity and reliability of the instruments used were ascertained in the pilot study. The reliability and validity of Wear Attitude Inventory were determined. For the three questionnaires on the implementation of Physical Education programme, the reliability and validity were observed on the four dimensions of the implementation Physical Education programme. The four dimensions were:

a. Teaching Ability
b. Administration of Physical Education Programme
c. Physical Education Class Distribution
d. Non-human Factors

In this study, a validity test was carried out using inter item correlation and the correlation between items and the total scores based on each of the four dimensions. In the Malaysian context, Abu Bakar (1987 cited in Mohd. Sahandri Gani, 1998) in "Developing A Scale In Affective Domain" suggested that a correlation coefficient of 0.30 as the acceptable minimum. The reliability was determined using the Cronbach Alpha method. This is to determine error variance and confirm whether true score is assessed; a coefficient value closer to 1.00 reflects less error variance and assessment of a more truer score. (Thomas & Nelson, 1990). In addition an Alpha value closer to 1.0 shows that all the items in the construct measure the same thing and as such the items are said to have high reliability (Nunnaly, 1978). However, Nitko (1983) noted that in the study of the uses of correlation in education, there is no magic point on the number line above which lie good correlation coefficient and below which lie poor ones. For this study, Wear Inventory Item 17, with its correlation coefficient of 0.29 was retained because of its discriminating nature.

3.5.2.1 Wear Physical Education Attitude Inventory

3.5.2.1.1 Correlation of Wear Inventory Items with Attitude

The score of each of the 30 items were correlated to the total score of the Wear Attitude Inventory. The results are tabulated below:

Table 3.3

Correlation of Wear Inventory Items With Attitude

Wear Inventory Items	Correlation with Attitude
Wear 01	.5650 **
Wear 02	.6323 **
Wear 03	.4282 **
Wear 04	.4892 **
Wear 05	.5216 **
Wear 06	.7980 **
Wear 07	.6022 **
Wear 08	.5197 **
Wear 09	.3728 **
Wear 10	.6706 **
Wear 11	.7016 **
Wear 12	.5903 **
Wear 13	.4489 **
Wear 14	.6762 **
Wear 15	.5211 **
Wear 16	.4988 **
Wear 17	.2922 **
Wear 18	.5103 **
Wear 19	.3166 **
Wear 20	.5587 **
Wear 21	.6392 **
Wear 22	.4067 **
Wear 23	.6029 **
Wear 24	.4511 **
Wear 25	.6427 **
Wear 26	.6160 **
Wear 27	.7201 **
Wear 28	.6281 **
Wear 29	.3657 **
Wear 30	.4714 **

** - significant < .01

The correlation scores ranged from a high of .79 to a low of .29 which were all significant at the .01 level of significance. The calculation of the correlation for each item is represented in Appendix Q .

3.5.2.1.2 The Reliability of the Wear Physical Education Attitude Inventory

At this time it seems appropriate to report the reliability or the internal consistency of the Wear Physical Education Attitude Inventory . The split half odd-even technique using the Spearman-Brown formula produced a reliability of .74 for this pilot study.

3.5.2.2 Factor Analysis of Items on the Implementation of Physical Education Programme for Teachers

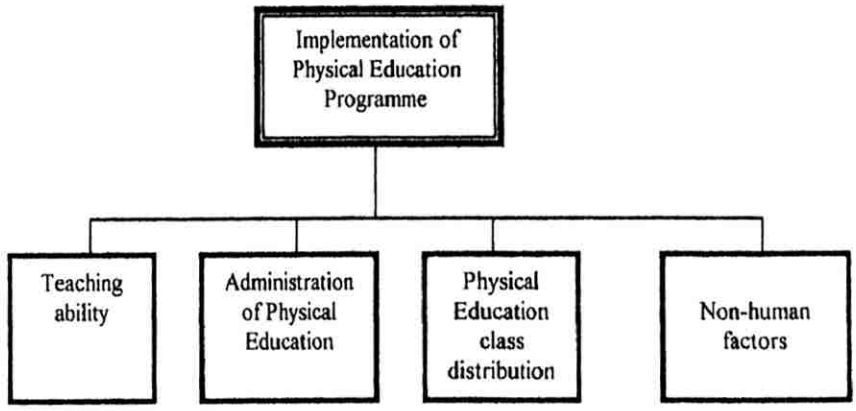

Figure 3.4 The four dimensions of the Implementation of Physical Education Programme

Factor analysis was conducted on four dimensions of the implementation of the Physical Education programme in Secondary Schools for Teachers (Appendix G). A total of 30 items from question 14 (7 items), question 15 (5 items), question 19 (6 items), question 20 (5 items) and question 21 (7 items) were analysed. The five

questions represented four dimensions of the implementation of the Physical Education programme based on the expert recommendation from the panel of eight experts.

The thirty item pool for the study was assembled after discussions with the panel of experts (Appendix J). The items selected were distributed over five questions in the questionnaire for Physical Education teachers (Questions 14, 15, 19, 20 and 21 in Appendix G). These questions were again distributed over four dimensions as reported in Table 3.4 below :

Table 3.4

The Four Dimensions Of The Implementation Of Physical Education Programme and Total Items For Each Dimension (Physical Education Teachers' Perception)

Dimension	*Question*	*Number of items*	*Total items*
Teaching Ability	14	7	12
	15	5	
Administration of the Physical Education Programme	21	7	7
Physical Education Class Distribution	20	5	5
Non-human Factor	19	6	6
Total			30

The raw data for the Physical Education teacher sample was factor analysed for the purpose of determining the emerging factors. The analysis revealed four dominant factors that is teaching ability, the administration of physical education programme, class distribution and the non-human factors.

The results following the varimax rotation are reported in Table 3.5. Final statistics revealed that four dimensions met the following criteria : (a) Each was based on dimensions with an eigen value > 1.0 (b) Only items with a community of 0.50 were selected (c) Each item included had no significant correlation with another dimension. Four dimensions emerged that met these criteria, accounting for 71.5 percent of the variance. The factors numbered 1 to 4 in order of extraction are Teaching Ability (6 items), Administration of Physical Education Programme (5 items), Physical Education Class Distribution (3 items) and Non-human Factors (3 items). A total of seventeen. items were extracted (Table 3.7).

Table 3.5

Principal Components Factor Analysis of the IOPEP Following Varimax Rotation

Item	*Factor* 1	2	3	4
1. Teaching Ability				
I can correct my students' weaknesses.	.87			
I have the knowledge to teach Physical Education.	.82			
I can manage the students in my class.	.80			
I can detect my students' weaknesses.	.79			
Unable to plan daily lessons.	.73			
I can teach game skills.	.67			
2. Administration of Physical Education programme				
Administrators discuss with teachers regarding factors affecting the teaching and learning of Physical Education.		.91		
Administrators organize in-house training for Physical Education.		.88		
It was given to me based on my interest.		.79		
It was given to me based on my Physical Education qualification.		.75		
It was determined after a discussion with the administration		.60		
3. Physical Education Class Distribution				
It was given as a filler to make up the total number of periods taught.			.89	
It was given to me without my knowledge.			.80	
Facilities for Physical Education classes are adequate			.76	
4. Non-human Factors				
Reference books on Physical Education are adequate.				.78
There is enough funds allocated for Physical Education.				.70
Reference books on Physical Education in Bahasa Malaysia are adequate				.69

* Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .53535
* Bartlett Test of Sphericity = 342.40483, Significance = .00000

Table 3.6

Intercorrelations and Descriptive Statistics for IOPEP Dimensions

Dimension	1	2	3	4
1. Teaching ability	1.00			
2. Administration of Physical Education programme	.29	1.00		
3. Physical Education class distribution	.29	.08	1.00	
4. Non-human factor	-.09	-.02	-.07	1.00

Dimension	M	SD
1. Teaching ability	22.23	4.07
2. Administration of Physical Education programme	12.50	5.18
3. Physical Education class distribution	9.76	3.19
4. Non-human factor	9.21	2.40

3.5.2.2.1 Reliability of the four dimensions of the Implementation of Physical Education Programme

The internal consistency for the Implementation of Physical Education Programme (IOPEP) was calculated using the alpha coefficient: Teaching Ability (Alpha = .8737), Administration of Physical Education Programme (Alpha = .8669), Physical Education Class Distribution (Alpha = .8047) and Non-human Factor (Alpha = .7433). These values were considered high and reliable based on works by Koustelios and Bagiatis (1997) and Cross (1973). They adopted an alpha r = .60 as an acceptable criterion for the internal consistency of scores on a scale. This means that the four dimensions of the IOPEP could be considered reliable.

Table 3.7

The items of the implementation Physical Education programme loaded on the four dimensions based on the perception of Physical Education teachers

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1. I can correct my students' weaknesses.
2. I have the knowledge to teach Physical Education.
3. I can manage the students in my class.
4. I can detect my students' weaknesses.
5. Unable to plan daily lessons.
6. I can teach game skills.

7. Administrators discuss with teachers regarding factors affecting the teaching and learning of Physical Education.
8. Administrators organise in-house training for Physical Education.
9. It was given to me based on my interest.
10. It was given to me based on my Physical Education qualification.
11. It was determined after a discussion with the administration

12. It was given as a filler to make up the total number of periods taught.
13. It was given to me without my knowledge.
14. Facilities for Physical Education classes are adequate.

15. Reference books on Physical Education are adequate.
16. There are enough funds allocated for Physical Education.
17. Reference books on Physical Education in Bahasa Malaysia are adequate.

<u>The implementation factors</u>

Factor 1 (Questions 1 – 6) - Teaching ability.

Factor 2 (Questions 7 – 11) - Administration of Physical Education programme

Factor 3 (Questions 12 – 14) - Physical Education class distribution

Factor 4 (Questions 15 – 17) - Non-human factors

Exploratory Factor Analysis (Koustelios & Bagiatis, 1977; Ridha Mohammed, 1984; Dish in Safrit & Wood, 1989; Thomas & Nelson, 1990) was conducted on the selected items to identify marker variables for the construct (the implementation of Physical Education Programme). Results showed that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to be 0.53535 (which Kinnear & Gray, 1996 suggested must be greater than 0.5) and the Bartlett Test of Sphericity of 342.40483 was significant at 0.000005.

Table 3.8

The Four Factors with Eigen Values Over One, Their Reliabilities, Percentages of Variance Accounted for by them, and the Items of Highest Loadings On Them

Factor	Eigen value	Reliability	% of variance accounted for	Items (Number)
1	5.09	0.87	29.9	1 - 6 (6)
2	3.14	0.86	18.5	7 – 11 (5)
3	1.98	0.80	11.7	12 – 14 (3)
4	1.93	0.74	11.4	15 – 17 (3)

3.5.2.2.2 Analysis of Validity and Reliability of four dimensions the construct of the Implementation of Physical Education Programme

The following sub-topics show the correlation matrixes of the four dimensions.

a. Teaching Ability

The items in this factor are related to the teaching ability of Physical Education teachers. They relate to the teaching skill, planning of teaching, managing class, knowledge of teaching content, and the ability to detect and correct students' weaknesses.

Table 3.9

Correlation Among Items on the Teaching Ability Of Physical Education Teachers

A	1	2	3	4	5	6
1	1	.79 **	. 77 *	.74 **	.87 **	.83 *
2		1	.44 *	.38 *	.76 **	.58 **
3			1	.64 **	.60 **	.56 **
4				1	.45 *	.65 **
5					1	.64 **
6						1

* - significant < .05 ** - significant < .01

Table 3.9 above shows the two tailed correlation determined by the Pearson correlation formula. All the correlation values are positive and significant with values ranging from 0.38 to 0.87. The lowest value of 0.38 was shown by the paired item of

A2 and A4 while the paired item of A1 and A5 showed the highest value of 0.87.

The reliability index of the items involved is obtained by observing the correlation coefficient with the total score of the factor and the results is shown in Table 3.9a.

Table 3.9a

Percentage of Responses According To Items Of Teaching Ability And Correlation Coefficients

Item	Response percentage					Correlation coefficient
	1	2	3	4	5	
A1	3.3	20.0	13.3	50.0	13.3	0.7993 **
A2	6.7	3.3	40.0	36.7	13.3	0.7786 **
A3	0.0	3.3	6.7	76.7	13.3	0.7495 **
A4	6.7	6.7	16.7	56.7	13.3	0.8728 **
A5	0.0	3.3	26.7	56.7	13.3	0.8341 **
A6	0.0	3.3	20.0	66.7	10.0	0.7601 **

** Significant at $p < .01$

Table 3.9a shows the correlation coefficient between each item and the total score of teaching ability of Physical Education factor. The correlation coefficients range from 0.7495 to 0.8728 and are significant at $p < 0.01$. All items show high correlation coefficients with item A3 demonstrated the lowest value of 0.7495 as compared to the highest value of 0.8728 by item A4. Similarly the reliability index

Cronbach Alpha of the factor (tabulated in Table 3.9b)is high.

Table 3.9b

Reliability Index For Each Item If Item Deleted and Standardised Item Alpha

Item	Alpha if item deleted	Standardised Item Alpha
A1	0.8596	0.8737
A2	0.8603	
A3	0.8599	
A4	0.8325	
A5	0.8416	
A6	0.8565	

Table 3.9b shows all the items which constituted the factor of teaching ability administration. The standardised alpha of 0.8737 is high. The value of alpha if an item is deleted when compared to the standardised alpha shows that all items have high reliability and are consistent.

b. Administration of Physical Education Programme

This factor contains items pertaining to the administration of the Physical Education programme in schools. It looks at the allocation of Physical Education classes based on interest, qualification as well as discussion between administrators and teachers. Secondly this construct also examines the professional development (in-house programmes) by school administrators and their discussion with teachers on improving teaching quality.

Table 3.10

Correlation Among Items of Physical Education Programme Administration

B	1	2	3	4	5
1	1	.48 **	. 45 *	.48 **	.37 *
2		1	.67 **	.51 **	.68 **
3			1	.50 **	.62 **
4				1	.85 **
5					1

* - significant < .05 ** - significant < .01

In this factor the two tailed correlation is determined by the Pearson correlation formula and the results are shown in Table 3.10 above. All the correlation values are positive and significant.

The reliability index of the items involved are obtained by observing the correlation coefficient with the total score of the factor and the results are shown in Table 3.10a.

Table 3.10a

Percentage of Responses According To Items Of Physical Education Programme Administration And Correlation Coefficients

Item	Response percentage					Correlation Coefficient
	1	2	3	4	5	
B1	30.0	6.7	26.7	30.0	6.7	0.7429 **
B2	33.3	13.3	20.0	23.3	10.0	0.8399 **
B3	33.3	16.7	20.0	20.0	10.0	0.8187 **
B4	30.0	40.0	20.0	3.3	6.7	0.7639 **
B5	23.3	36.7	26.7	6.7	6.7	0.7947 **

** Significant at $p < .01$

Table 3.10a shows the correlation coefficient between each item and the total score of the Physical Education programme administration factor. The correlation coefficients range from 0.7429 to 0.8399 and are significant at $p < 0.01$. All items show high correlation coefficients with item B1 demonstrating the lowest value of 0.7429 as compared to the highest value of 0.8399 by item B2. Similarly the reliability index Cronbach Alpha of the factor (tabulated in Table 3.10b) is high.

Table 3.10b

Reliability Index For Each Item If Item Deleted and Standardised Item Alpha

Item	Alpha if item deleted	Standardised Item Alpha
B1	0.8705	0.8669
B2	0.8177	
B3	0.8285	
B4	0.8274	
B5	0.8110	

Table 3.10b shows all the items which constitute the Physical Education Administration factor. The standardised alpha of 0.8669 is high. The value of alpha if an item is deleted when compared to the standardised alpha show that all items have high reliability and are consistent.

c. Physical Education Class Distribution

The items in this factor are related to the distribution of Physical Education classes in school. The items seek the perception of Physical Education teachers on the allocation of Physical Education classes to them by the administrators.

Table 3.11

Correlation Among Items of Physical Education Class Distribution

C	1	2	3
1	1	.67 **	.47 **
2		1	.58 **
3			1

** - significant < .01

Table 3.11 above shows the two tailed correlation determined by Pearson correlation formula. All the correlation values are positive and significant with values ranging from 0.47 to 0.67. The lowest value of 0.47 was shown by the paired item of C1 and C3 while the paired item of C1 and C2 showed the highest value of 0.67.

The reliability index of the items is obtained by observing correlation coefficient with the total score of the factor and the results are shown in Table 3.11a.

Table 3.11a

Percentage of Responses According To Items Of Class Distribution and Coefficients

Item	Response percentage					Correlation Coefficient
	1	2	3	4	5	
C1	43.3	13.3	23.3	13.3	6.7	0.8656 **
C2	20.0	23.3	26.7	6.7	23.3	0.9089 **
C3	6.8	34.1	11.4	37.5	10.2	0.7612 **

** Significant at $p < .01$

Table 3.11a shows the correlation coefficient between each item and the total score of Physical Education class distribution factor. The correlation coefficients range from 0.7612 to 0.9089 and are significant at $p < 0.01$. All items show high correlation coefficients with item C3 demonstrated the lowest value of 0.7612 as compared to the highest value of 0.9089 by item C2. Similarly the reliability index Cronbach Alpha (tabulated in Table 3.11b) is high.

Table 3.11b

Reliability Index For Each Item If Item Deleted and Standardised Item Alpha

Item	Alpha if item deleted	Standardised Item Alpha
C1	0.6979	0.8047
C2	0.6201	
C3	0.8035	

Table 3.11b shows all the items which constitute the factor for Physical Education class distribution. The standardised alpha of 0.8047 is high. The values of alpha if each item is deleted when compared to the standardised alpha show that all items have high reliability and are consistent.

d. Non-human Factors

The items in this factor are related to the facilities and reference books for Physical Education classes.

Table 3.12

Correlation Among Items of Non-human factor

D	1	2	3
1	1	.40 **	.39 **
2		1	.67 **
3			1

** - significant < .01

Table 3.12 above shows the two tailed correlation determined by the Pearson correlation formula. All the correlation values are positive and significant with values ranging from 0.39 to 0.67. The lowest value of 0.39 is shown by the paired item of D1 and D3 while the paired item of D2 and D3 show the highest value of 0.67.

The reliability index of the items is obtained by observing the correlation coefficient with the total score of the factor and the results are shown in Table 3.12a.

Table 3.12a

Percentage of Responses According To Items Of Non-human Factor and Coefficients

Item	Response percentage					Correlation Coefficient
	1	2	3	4	5	
D1	3.4	31.5	23.6	36.0	5.6	0.7463 **
D2	4.5	29.5	26.1	36.4	3.4	0.8510 **
D3	3.4	28.4	26.1	39.8	2.3	0.8411 **

** Significant at $p < .01$

Table 3.12a shows the correlation coefficient between each item and the total score of Physical Education Non-human factor. The correlation coefficients range from 0.7463 to 0.8510 and are significant at $p < 0.01$. All items show high correlation coefficients with item D1 demonstrating the lowest value of 0.7463 as compared to the highest value of 0.8510 by item D2. Similarly the reliability index Cronbach Alpha of the factor (tabulated in Table 3.12b) is high.

Table 3.12b

Reliability Index For Each Item If Item Deleted and Standardised Item Alpha

Item	Alpha if item deleted	Standardised Item Alpha
D1	0.8053	0.7433
D2	0.5644	
D3	0.5764	

Table 3.12b shows all the items which constitute the factor for Physical Education Non-human factor. The standardised alpha of 0.7433 is high. The value of alpha if each item is deleted when compared to the standardised alpha show that item D1 has high reliability. However the other items show consistency.

3.6 Procedures

Questionnaires were administered to the administrators (principals, senior assistants) and teachers teaching Physical Education in randomly selected secondary schools in Peninsular Malaysia. The questionnaires were posted to the selected schools after getting the approval from the State Education Department. Stamped self-addressed envelopes were provided to ensure a better return rate.

Each respondent was given two instruments to be completed in the order they were arranged. The principals were requested to answer Appendix E (IOPEP1) followed by Appendix D (WPEAI). The senior assistants were asked to respond to Appendix F (IOPEP2), followed by Appendix D. The Physical Education teachers were asked to answer Appendix G (IOPEP3), followed by Appendix D.

3.7 Data collection and Analysis

A period of seven weeks from 24 September 1998 to 13 November 1998 was set aside for the collection of data. The collection of data was through mailing of questionnaires to randomly selected schools.

Adequate percentage returns should be observed for mailed questionnaires. Babbie (1973: 165) stated that a 50 percent return is adequate for analysis and reporting, 60 percent is good and 70 percent is very good. Of the 290 schools chosen, 267 schools responded and questionnaires were returned within the stipulated dateline. The response rate was 92.1%.

Two sets of data were collected from the study:

(1) the data from the Wear Physical Education Attitude Inventory (WPEAI), and

(2) the data from questionnaires on the Implementation of Physical Education Programme (IOPEP).

The raw scores from the above-mentioned questionnaires were used for analysis. For WPEAI (Appendix D), items were weighed on a priori weight method from Strongly Agree (5) to Strongly Disagree (1). The Likert scales used were as follows:

5 : Strongly Agree

4 : Agree

3 : Undecided

2 : Disagree

1 : Strongly Disagree

The scores given are for positive statements and the reverse is true for the negative statements.

For the questionnaires on the Implementation of Physical Education Programme (IOPEP) (Appendix E, F and G) the same Likert scale from Strongly Agree to Strongly Disagree was also used. In addition, items on the administration of Physical Education programme (Question 14 in Appendix E; Question 12 in Appendix F; Question 20 and Question 21in Appendix G) were weighed on a priori weight method from Almost Always (5) to Almost Never (1). The Likert Scales used were as follows :

5 : Almost Always
4 : Frequently
3 : Occasionally
2 : Rarely
1 : Almost Never

The scores given were for positive statements and the reverse is true for the negative statements.

For question on *'problems faced when teaching Physical Education in school'* (Question 15 in Appendix G) items were weighed on a priori weight method from Not Serious At All (5) to Very Serious (1). The Likert Scales used were as follows :

5 : Not Serious At All
4 : Not Serious
3 : Fairly Serious
2 : Serious
1 : Very Serious

The scores given are for positive statements and the reverse is true for the negative statements.

Two types of statistical techniques were used to analyse the data, namely, descriptive and inferential statistics. Descriptive statistics such as means, standard deviations, minimum and maximum were used to report the data from three questionnaires on the Implementation of Physical Education Programme (IOPEP). They were used for the analysis of the following data:

a. demographic variables of the sample;
b. school-related variables of the sample;
c. allocation of Physical Education classes;
d. administration of Physical Education programme
e. problems faced by Physical Education teachers in schools;
f. frequency of Physical Education committee meeting;
g. frequency of in-house training;
h. courses attended from non Malaysian Ministry of Education agencies.

Inferential statistics such as correlation, t-test, and analysis of variance (ANOVA) were used. T-tests were computed to determine whether differences existed in the attitude mean scores for each sub-category. Several one-way ANOVA would be computed to determine whether differences existed between the attitude mean scores for the independent factors of gender, age, race, field of specialisation, working experience, and school background. All t-test and ANOVA in this study were carried out using SPSS for Windows.

Since one of the assumption for a valid t-test is homogeneity of variance, the ***Levene test*** for homogeneity of variance was observed in this study. Two types of variance were considered in the interpretation of the statistical analysis that is the pooled variance estimate (Equal Variances) and separate variance estimate (Unequal Variances). As advised by Kinnear & Gray (1996) and Norusis (1997), when the F value

is not significant ($p > 0.05$) the variances are assumed to be homogeneous and the Equal Variances line of values for the t-test is used. On the contrary, if the F value is significant ($p < 0.05$), then the homogeneity of variance is violated and t-test based on separate variance estimates (Unequal Variances) is used. All tests of significance were at the .05 level . For the one-way ANOVA, where F-tests were significant, a post-hoc test using the Tukey-HSD test was employed.

Factor analysis was used to isolate the traits of the possible common factors on items of Appendix G which were related to the implementation of the Physical Education programme in secondary schools. A total of 5 questions and 30 items were involved that is question 14 (7 items), question 15 (5 items), question 19 (6 items), question 20 (5 items), question 21 (7 items). The clustering of the items' loading identified certain common factors. The factors were teaching ability, the administration of Physical Education programme, Physical Education class distribution and non-human factors.