AN INVESTIGATION INTO DIFFERENCES BETWEEN OUT-OF-FIELD AND IN-FIELD HISTORY TEACHERS' INFLUENCE ON STUDENTS' LEARNING EXPERIENCES IN MALAYSIAN SECONDARY SCHOOLS

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Abstract

The focus of this study was to investigate whether there were differences between the way in-field and out-of-field teachers in Malaysian secondary schools perceived and practised History education, and the way their students perceived the teaching and learning of History. In addition, it sought what approaches to learning students adopted in the History classroom, and how far curriculum learning objectives in History had been achieved.

The theoretical model developed was drawn from Biggs' 3P (Presage, Process, and Product) Model of Learning to examine the possible relationships between two sets of variables related to teachers and students. The teacher level variables were teachers' characteristics, years of teaching (experience), and approaches to teaching, classroom methods, and teaching conceptions. Student level variables related to student characteristics, students' approaches to learning, classroom climate, and History learning objectives.

The study adopted quantitative method to answer three major research questions that were derived from the theoretical model. The respondents involved in this study were drawn from 18 of the 94 secondary schools in Kuala Lumpur, Malaysia. A total of 52 History teachers and 1653 students from year 11 (Form Four) participated. The method involved collecting information from the respondents by using two sets of questionnaires, one for teachers and one for students. A factor analysis of the model constructs based on Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), using Structural Equation Modeling (SEM), was employed to validate the constructs in the survey instrument, by testing their fit in the different measurement models used. Partial Least

Square (PLS) and Hierarchical Linear Modeling (HLM) were used for testing the relationships between the variables examined in this study.

According to the research results, no statistically significant differences emerged between in-field and out-of-field teachers on a number of key variables, such as approaches to teaching, methods of teaching and students' approaches to learning. On the other hand, there were a number of other variables where the statistical analysis revealed differences between in-field and out-of-field teachers. These included the teacher characteristic of experience, the dimensions of classroom climate, both preferred and actual, especially in relation to the personalisation of teaching in response to students' needs and interests and, most importantly, students' learning outcomes, defined in terms of their understanding and appreciation of the objectives of the History syllabus they were studying. Despite the limitations of data being gathered only from Kuala Lumpur secondary schools, the results of this study provide some justification for the steps taken by Malaysian government to employ out-of-field History teachers in secondary schools in Malaysia. It is a policy which can be continued, provided the issues surrounding out-of-field History teachers discussed above are properly understood and appropriately handled.

Declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Umi Kalsum Mohd Salleh and, to the best of my knowledge and belief, contains no material previously published or written by another person, excepts where due reference has been made in the text.

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Chapter 1 Introduction: Teachers' Qualifications and The Malaysian Education System

1.1 Background to the Study

Introduction

Malaysia emerged as independent modern nation after 500 years of foreign occupation and economic exploitation from three European countries and one Asian - Portuguese in the 16th century, Dutch in the 17th century, British from the late 18th century, and Japanese from 1941 to 1945 with independence, *merdeka* - from Britain achieved in 1957 (Thomas, 2011).The peoples of the new nation of Malaysia came from different cultural and social groups such as the Malay people, the Chinese community descended from early traders who settled in the region, and the Indians whose forefathers were brought into the plantations as indentured laborers under British colonial rule. Each group had its own distinctive history, little of which was recognized or taught in schools during the period of British rule. The Education System, inherited from the British colonial rule, was essentially a British (English) type of education' which needed to be gradually changed into a Malaysian education system with a Malaysian outlook and a Malaysian oriented curriculum (Rahimah, 1998).

Today the teaching of History in the 55 year old nation of Malaysia is regarded as so important that all students from Form One (13 years of age) to Form Five (17 years of age) are required to study it at school. Making History a compulsory subject, taught in the Malay language is important in recognizing its vital role in developing a sense of belonging to the one Malaysian nation. History education is recognised as a tool to infuse the idea of belonging, the spirit of patriotism, the love of country, and commitment to the Malaysian nation. Moreover, the generation of post-independence students need to understand how different peoples and cultures have contributed to making Malaysia an independent, sovereign nation which justly has a place in the world community (Thomas, 2011).

However, two practical issues in relation to the teaching of History have emerged. The immediate practical problem was to have enough teachers for all the History classrooms. Since there were not enough History education graduates to fill this need, teachers not trained in History had to be assigned to many classrooms. There was great concern that this temporary expedient would lead to a lowering of standards in the teaching of History, the very subject that was regarded as vital to the development of the emerging nation.

While the Malaysian National Education Blueprint (2007) aims to provide high quality and well trained teachers in secondary school, the fact is that many teachers in Malaysian secondary schools have been required to teach subjects in which they have no university degree and no prior teacher training. Thus 'out-of-field teaching' refers to the practice of teaching in a subject, field or level of schooling for which a teacher has neither a major nor minor tertiary qualification (McConney & Prince, 2009b). The issue of out-of-field teaching is prevalent in Malaysia, with the numbers dramatically increasing in a rapidly expanding school system. So the employment of History teachers who are not specialists in the subject of History, or are minimally qualified in this teaching area, is quite common in Malaysia. This study investigates the possible differences between out-of-field and in-field History teachers with respect to their conception of teaching, teaching approaches, and teaching methods. Moreover, this study also investigates the students' views of the History classroom learning environment, learning approaches and the objectives of the teaching and learning of History.

Rationale of the study

Previous research has suggested that teachers' historical and pedagogical knowledge and values are factors that influence the teaching and learning of History (Shulman, 1987; VanSledright, 1996). Hence, teachers who are strong in these factors may be expected to achieve more effective teaching of History in the classroom. Thus, the current situation in Malaysia of employing many out-of-field teachers may be a significant factor influencing the overall quality of Malaysian History education. The question that arises is: Does the teaching of out-of-field teachers differ from that of well trained (in-field) History teachers,with consequent differences in the learning experiences of their students?

In educational research, most studies focus only on the qualified teachers who are teaching in elementary and secondary schools. Yet, worldwide, it is likely that a large number of classes are taught by teachers who are not formally qualified, or are seriously underqualified, in the subjects they teach (Mullis et al., 2000; OECD 1994, 2005; Wang et al., 2003, all cited in Ingersoll, 2007). Ingersoll (2007) stated that out-of-field teaching occurs in many countries, including Australia and the United States (US). For instance, over one third of all those who teach secondary school Mathematics and English in the United States do not have a major in those subjects, or in a related discipline. In addition, 29 per cent of all teachers of secondary school classes in Science do not have a college major in Science or in Science Education. In Asian countries, such as China, Hong Kong, and Thailand, some teachers are regularly assigned to teach classes that do not match their educational background. In Thailand, about one quarter of those teaching Mathematics, the Social

Sciences and the Thai language do not hold a certificate in those fields. Similarly in Hong Kong, almost one third of teachers of Mathematics and Social Sciences do not hold a degree in their teaching subjects (Ingersoll, 2007).

In Malaysia, out-of-field teaching has not been systematically researched (Aini Hassan & Wan Hasmah Wan Mamat, 2007). However, it is prevalent today in Malaysia as is shown by 2002-2005 data from the Intensified Research in Priority Areas Study (IRPA) (Aini Hassan & Wan Hasmah Wan Mamat, 2007). For example, the findings show that many students from the Diploma of Education Program who major in Teaching English as a Second Language (TESL) lack content knowledge in the subject. The situation in History is similar. Data from the Ministry of Education in 1991 indicated that out-of-field teacher teaching in History was 46.4 per cent. This showed that almost half of those teaching History in secondary schools in Malaysia lacked appropriate training in the subject (Ministry of Education, 1991 cited in Aini Hassan et al., 2007). More recently, the findings from a total of 401 teachers surveyed, indicated that from the 17 respondents teaching History only five of them had majored in History and thus 12 of the teachers were out-of-field teachers (Aini Hassan & Wan Hasmah Wan Mamat, 2007). Aini Hassan (1998) claimed that these figures suggested a low effectiveness in teaching and learning History in the classroom.

In order to overcome the perceived problem, Aini Hassan and Wan Hasmah Wan Mamat (2007) suggested that the education authority should make the enrolment and training requirements in the Diploma of Education Program, more restrictive, deeper and stricter, to ensure a higher quality of teachers in the schools. This view was supported by Ingersoll (2007) who claimed that in the United States the quality of teachers and teaching are among the most important factors shaping the learning and growth of the student.

Moreover, this suggestion by Aini Hassan and Wan Hasmah Wan Mamat (2007) was highly relevant to one of the aims of the Malaysian National Education Blueprint 2007-2010 which addressed improvement in the teaching profession by focusing on providing more qualified and better trained teachers for Malaysian schools (National Education Blueprint, 2007). However, many states in Malaysia are faced with an inadequate supply of fully trained teachers and they may be expected to struggle to meet this mandate because of need to the employ an increasing number of teachers across the school system (Aini Hassan et al. 2007).

In addition to subject knowledge, Shulman (1986) suggested that teachers should also possess pedagogical content knowledge, which is 'the ways of representing and formulating the subject that make it comprehensible to others' (Shulman, 1986, p. 9). In order to make the curriculum accessible to their students in the classroom. As well, teachers' underlying attitudes and values about teaching in general, and teaching History in particular, would have an influence on their teaching practices. Therefore, it is important to know whether there are differences in these three areas between fully qualified teachers of History and the out-of-field teachers.

All of these claims suggest that the teacher's preparations, including qualifications and training, are vital in improving teaching and learning in Malaysian schools. However, limited research has been undertaken in Malaysia on how out-of-field teachers teach in their classrooms. Most of the recognised research on this topic is at a descriptive level, such as (a) qualification and preparation of the teachers (Ingersoll, 2007); (b) the percentage and number of subjects taught by out-of-field teachers teaching in the classroom (Jerald, 2002); (c) the percentages of out-of-field teaching in History and social sciences (Ingersoll, 1999). Unlike previous research this study focuses more deeply on whether there are differences in the conceptions of teaching and classroom practice between in-field teachers and out-of-field teachers in the classroom. Prior to this, it is essential to know how the Malaysian education system and the History syllabus operate, in order to understand the background of History as a core subject in secondary schooling in Malaysia.

The National Educational System

The Malaysian National Education Philosophy focuses on both the primary and secondary levels. It is holistic in that it includes the statement to develop students intellectually, spiritually, physically and emotionally, and ensures the development of all domains; cognitive, affective, and psychomotor, as stated in the National Educational Philosophy (Ministry of Education, 1993).

> Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well being as well as being able to contribute to the harmony and betterment of the family, society and nation at large. (Ministry of Education, 1993, p. ii)

Malaysia has a centralised curriculum under the National Educational Philosophy and the Curriculum Development Centre (CDC) is in charge of formulating, developing, implementing and evaluating curriculum in all subjects for schools in Malaysia. The major guidelines and policies for the CDC are set by the Ministry of Education. In 2006, the Prime Minister of Malaysia launched the National Education Blueprint 2006-2010, and the Minister of Education decided that one of the main strategies to strengthen the national education system was to ensure that the teaching profession was respected and held in high regard, with trust and responsibility placed on it to build future generations. Hence, this study is relevant to the mission of national education. The next section discusses the background of History as a core subject in the school.

History as a subject in Malaysian secondary schools

The education system in Malaysia consists of four levels of schooling: pre-school, primary, secondary, and pre-university. The pre-school education starts at the age of 4-6 years, with students then spending six years in formal primary school. At the primary level, the Integrated Primary School Curriculum (*Kurikulum Bersepadu Sekolah Rendah* - KBSR) is used and this is based on the National Philosophy of Education, and focuses on reading, writing and numeracy. At Primary Four (Year Four) students are introduced to social studies, which puts the emphasis on local studies instead of History, which is only introduced to students at the secondary school level. At the end of Primary Six (Year Six), the students sit for a public examination; *Ujian Penilaian Sekolah Rendah* (The Primary School Assessment Test). The Standard-based Curriculum for Primary School (KSSR) has been implemented in stages starting in 2011, to replace KBSR. History subject only be a core subject in the secondary level.

Secondary school education consists of three years in the lower secondary school and two years in the upper secondary school. There are several types of school at the secondary school level: state academic, technical and vocational schools, and religious national schools. At the secondary level, the Integrated Secondary School Curriculum (*Kurilulum Bersepadu Sekolah Menengah* - KBSM) is implemented. This curriculum is a continuation of the KBSR and at the lower secondary school level and retains the structure and the subject offerings of the KBSR. History, as one of the core subjects, includes the History of Malaysia and its development from the early Malaysian History to the present (Harris, 1997). At the end of the lower secondary level, Form Three (Year 9), the students have to sit for a public examination in several subjects, including History (the *Peperiksaan Menengah Rendah* (Malaysian Lower Examination).

Upper secondary school students are prepared partially for employment and partially for further higher education. The curriculum at this level consists of three components of subjects, with compulsory, elective, and additional subject components. Students are allowed to choose their elective subjects from two of these three components. History is one of the core subjects at this level; the contents include World History (Form Four) and Malaysian History (Form Five). At the end of Form Five (Year 11), students are required to sit for the public examination called *Sijil Pelajaran Malaysia* (Malaysian Certificate of Education). Table 1.1 summarises the subjects provided in upper secondary schools in Malaysia.

Furthermore, after Form Five the students are given two options, whether to choose Form Six or to enrol in the matriculation programme. In Form Six they have to sit for the public exam called *Sijil Tinggi Pelajaran Malaysia* (Malaysian Higher School Certificate Examination) after they complete their studies over two years. The Form Six examination is run by the Malaysian Council Examination. Success in this examination is a ticket to attend the local universities and is also internationally recognised. On the other hand, for those who choose the matriculation programme, there is a one or two year programme, run by the Ministry of Education. Students who succeed in the matriculation examination can only enrol at local universities.

Table 1.1 Subjects in Malaysian Secondary Schools (Upper) in 2010 (Ministry of Education, Malaysia, 2002)

Core Subjects/Compulsory	Bahasa Malaysia *(Malay Language)* English Language Mathematics General Science **History *(Sejarah)*** Moral Education *(Pendidikan Hidup)* – for Non-Muslim Students Islamic Education *(Pendidikan Islam)* – for Muslim Students Art Education *(Pendidkan Seni)* Physical & Health Education *(Pendidkan Jasmani & Kesihatan)*
Elective Subjects Arts Electives	Geography *(Geografi)* Malay Literature Principles of Account *(Prinsip Akaun)* Commerce *(Perdagangan)* Basic Economics *(Ekonomi Asas)* Arts Education *(Pendidkan Seni)*
Science Electives	Biology Chemistry Physics Arts Education *(Pendidkan Seni)* Additional Mathematics
Additional Subjects	Mandarin English Literature Information Communication Technology

There are also programs preparing students to enter overseas universities, so that they can sit for the UK *A-levels, Associate American Degree Program*, or the *Australian Matriculation Program*. At this level, History is optional for students and there is no public examination.

The History Syllabus Implementation

Since 1992, History has been one of the core subjects in the Malaysian secondary schools. Students learn History from Form One (equivalent to Year 7 in Australia), until Form Five (equivalent to Year 11 in Australia) with the subject being assessed in two public examinations, the *Peperiksaan Menengah Rendah* (Malaysian Lower Examination) and the *Sijil Pelajaran Malaysia* (Malaysian Certificate of Education). History teaching is based on the national curriculum and syllabus. Although there is no national examination in Form Four (equivalent to Year Ten in Australia), the level at which this study was conducted, teachers are obliged to complete the syllabus by the end of the year. There are three 40 minute periods per week, with the timetable designed to include a double period and a single period each week. There are ten chapters in the Form Four History syllabus, which are summarized in Table 1.2.

Table 1.2 History Syllabus in Form Four (Year 10) (Ministry of Education, Malaysia, 2002)

Chapters	Topics
1	*Kemunculan Tamadun Awal Manusia* (The Emergence of Early Human Civilisation)
2	*Peningkatan Tamadun* (The Rise of Civilisation)
3	*Tamadun Awal di Asia Tenggara* (The Early Civilisation in Southeast Asia)
4	*Kemunculan Tamadun Islam dan Perkembangannya di Makkah* (The rise of Islamic Civilisation and its spread in Mecca)
5	*Kerajaan Islam di Madinah* (The Islamic Government in Medina)
6	*Pembentukan Kerajaan Islam dan Sumbangannya* (The Formation of the Islamic Government and Its Contribution)
7	*Islam di Asia Tenggara* (Islam in Southeast Asia)
8	*Pembaharuan dan Pengaruh Islam di Malaysia Sebelum Kedatangan Barat* (The Development and Influence of Islam Before the Arrival of the West)
9	*Perkembangan di Eropah* (The Development in Europe)
10	*Dasar British dan Kesannya terhadap Ekonomi Negara* (The British policies and their effects on the Malaysian Economy)

With reference to Table 1.2, the content of History in Form Four is grouped into three areas: Human Civilisation, Islamic Civilisation *and* European History. This reflects the Malaysian National Education Philosophy where the emphasis is on building a truly Malaysian society of the future by adopting a holistic (i.e., intellectual, spiritual, physical and emotional) approach to ensure human development in all domains (i.e., cognitive, affective, and psychomotor).

According to the History syllabus documentation, the aim of World History is to inculcate a spirit of patriotism and feeling of pride in being a Malaysian and a world citizen. It is argued that through the development of knowledge and understanding of the country's History, pupils will understand the conditions of the society and country and therefore develop a spirit of unity. The teaching of History as a subject could also create shared memories of the past, which can serve as a framework for the reference of national awareness and international understanding (Ministry of Education*,* 2002).

As stated in the History curriculum (Ministry of Education, 2002), the objectives of this subject at the secondary school level are to enable students to:

- state the importance of History as a discipline of knowledge and to apply it in lifelong independent learning;
- explain the political, economic, and social development in the society and the country;
- describe the social and cultural characteristics of Malaysia and practise them in their daily life;
- appreciate the efforts and contributions of individuals who have struggled for the sovereignty, independence, and development of the country, and to defend the dignity of the Malaysian races;
- possess the spirit of patriotism and participation in the efforts to defend the sovereignty, development and progress of the country
- explain the position of Malaysia as part of world civilisation and its contribution at the international level;
- learn from the experience in History in order to enhance the thinking ability and maturity;
- practise moral values; and
- analyse, summarise and evaluate rationally the historical facts of Malaysia and the outside world

Importantly, one of the aims is to develop historical thinking skills. The goal here is to help students to differentiate between facts and opinions and to remove bias. Students also learn to present logical and coherent arguments, supported by the historical data that they have learned in school. Furthermore, through the History curriculum, students should develop an understanding of the relationship between major events and movements from the local to the global, and from the past to the present. Finally, students should respect the culture and heritage of other communities, as well as having a sense of national identity and becoming responsible citizens. Since this research study focuses on History teaching by 'out-of-field' teachers, the next section discusses the definition of terms related to this topic.

Definition of terms

Out-of-field teachers refers to those who are assigned to teach in fields that do not match their education background. Consequently, the out-of-field teachers in this research study were those teachers who did not specialise in History education (Ministry of Education, 1991).

In-field History teachers refers to those who hold a tertiary major or minor in History education, and are assigned to teach subjects that match their History education background, which includes both historical study and History teaching methodology.

Form Four Students are students aged 16 to 17 years old, equivalent to Year 10 students in Australia. This level was chosen for the research because students in Form Four were not sitting for any exams; researchers are not encouraged to do research in the exam classes such as in Form Three (equivalent to Year 9 in Australia) and Form Five (equivalent to Year 11 in Australia)

History as a Subject refers to one of the compulsory subjects that is taught from Form One (equivalent to Year 7 in Australia) until Form Five (equivalent to Year 11 in Australia) in Malaysian secondary schools.

1.2 Aims and objectives of the study

One of the focuses of the National Education Blueprint *2006-2010* was to provide more qualified and trained teachers for schools. In practice, teachers have been in short supply, and consequently there are many out-of-field teachers in the schools. Therefore, the aim of this study is to investigate whether there were differences between the way in-field and out-of-field teachers perceived and practised History education, and the way their students perceived their History learning experiences. One particular focus of the study was how students approached History learning, that is, whether they adopted deep, surface or achievement strategies (Biggs, 1987), which could possibly be related to teachers' views of History and their teaching approaches. Thus, this study aimed to investigate the type of approaches to learning that students adopted in the History classroom as well as students' views on how far the curriculum learning objectives had been achieved.

1.3 Research Question

There were three main research questions in this study, with the first broken into a number of more specific sub-questions.

1. Are there any differences between out-of-field and in-field History teachers?
   a) Are there any differences in individual characteristics (age, gender, ethnicity, and teacher experience) between out-of-field and in-field History teachers?

b) Are there any differences in teachers' conceptions of teaching between out-of-field and in-field History teachers?
c) Are there any differences in teachers' teaching approaches between out-of-field and in-field History teachers?
d) Are there any differences in teachers' teaching methods and practices between out-of-field and in-field History teachers?
e) Are there any differences in students' learning environment in the classrooms of out-of-field as compared to in-field History teachers?
f) Are there any differences in students' approaches to learning in the classrooms of out-of-field as compared to in-field History teachers?
g) Are there any differences in how students of out-of-field and in-field History teachers perceive History learning objectives?

2. What are the impacts of teacher qualifications (in-field and out-of-field) on the History teaching and learning processes at the classroom and student level?
3. How do the teacher qualifications (in-field and out-of-field) interact with other factors in influencing the teaching and learning process in the History classroom?

1.4 Significance and contribution to education

The findings of this study are likely to be useful to policy makers and administrators when deciding whether the current practices of assigning teachers are suitable for use in Malaysian secondary schools. Since the numbers of in-field History teachers have declined in Malaysian schools, it is important to know to what extent out-of-field History teachers are competent to teach in the Malaysian classrooms. Additionally, this study is likely to inform all educators about the nature and importance of teachers' conceptions of teaching and learning History. Teachers have varied conceptions of learning and teaching and this study can identify how they perceive the learning situation and the teaching strategies in History classrooms. The findings of this study can also provide an understanding of students' views of their learning environment, and of History learning objectives. These may suggest what changes are needed to promote better learning in History classrooms in Malaysian secondary schools.

The findings may also contribute to improving the teaching and learning of History in Malaysia, by developing a better understanding of the similarities and differences among History teachers' conceptions, pedagogies, and teaching practices. In this way, the study can help teacher educators and policy makers to work toward to the inculcation of better teaching practices in the future.

Finally, the findings of this research study are likely to inform educators of the relationships between students' approaches to learning and the learning environment of the classroom, a finding which may facilitate the development of better learning environments in the Malaysian secondary school classrooms in the future.

1.5 Summary

This chapter introduces the background of the study, the context of the research setting in the Malaysian education system, and details of the provision of History as a subject in the Malaysian curriculum. The research study was designed to investigate the identifiable differences between out-of-field and in-field History teachers, in relation to their students' History learning experiences in Malaysian secondary schools. The following chapter provides the literature review of previous research in areas relevant to this topic.

Chapter 2 Literature Review: Teachers and Effective Student Learning In History

2.1 Introduction

This literature review chapter begins by considering international and Malaysian studies related to the issue of out-of-field teaching. The discussion then follows the lead of studies which pointed to the importance of factors other than teacher qualifications in the quality of students' learning. Such studies have investigated the relationship between teachers' conceptions of learning, their methods in the classroom, and History teaching in particular. In addition, recent research has pointed to the importance of students' learning approaches, their perceptions of the classroom learning environment and their perceptions of learning History as factor in student learning. The final section of the chapter outlines Biggs' 3P conceptual framework, as the research model on which this study was based and explains the importance of the Causal Model used to guide data collection and analysis.

2.2 Background to 'out-of-field' teaching

It is important to explain the meaning of out-of-field teaching because it is not widely understood within the educational field. Out-of-field teaching was largely unrecognised phenomenon until it was highlighted by Ingersoll (1999; 2000; 2001; 2011) who applied the term to those teachers assigned to teach subjects, for which they had little education, or which did not match their field of specialty or training (Ingersoll, 2001; Ingersoll & Merril, 2011). Similarly, the United States Department of Education, defined 'teachers as out-of-field if they did not hold an undergraduate major or minor in the field that they taught most courses' (Zumwalt & Craig, 2005, p.174). In another study, McConney and Price, (2009a, 2009b) in Western Australia, defined out-of-field teaching as 'teaching in a subject/field for which a teacher has neither a major nor minor tertiary (university) teaching qualification. Also, it means teaching at a level of schooling for which a teacher is not formally qualified' (McConney & Prince, (2009a, p. 9, 2009b p. 87). In Malaysia, out-of-field teaching refers to those teachers who are assigned to teach in fields that do not match their educational background. Consequently, out-of-field, History teachers in this study of Malaysian History classrooms are defined as teachers who do not have a university degree in History education or those teachers who did not hold a tertiary major or minor qualification in History education (Ministry of Education, Malaysia, 1991).

The causes of out-of-field teaching

There are several reasons why out-of-field teaching occurs in education. Ingersoll (1998, 1999, 2000) stated that the mismatch between a teacher's qualification and teaching assignment, the demands of the teachers' union and the shortages of teachers in a particular field were all factors that caused out-of-field teaching.

According to Ingersoll (1998), school principals mis-assigned teachers to teach classes that did not match their training or education. Besides the mis-matching of teachers, the teachers' unions also contributed to the out-of-field teaching situations (Ingersoll, 1998; Ingersoll & Merrill, 2011). Based on seniority rules, privileges were given to senior or experienced teachers, regardless of their qualifications or competency to teach a subject that they had not specialised in. Thus senior teachers were often given an out-of-field assignment when a qualified junior teacher was transferred. This often happened when teachers were in oversupply, in order to reduce or shift teachers as a result of a fiscal cutbacks or declining enrolments in a school. This was the most common reason for classrooms having out-of field teachers (Ingersoll 1998, p.775).

Teacher shortage was another reason that contributed to the out-of-field teaching situation. Inaccurate calculation of teacher turnover created problems because it led to failure to provide the precise number of qualified teachers needed in the schools. McConney and Prince (2009b) suggested that the teacher shortage indicators failed to estimate the required number of teachers qualified in specific subjects. In this regard, school administrators needed to know the exact number of teachers required in each specialist area in order to prevent mis-assignment occurring in the schools.

In addition, Ingersoll (1998) pointed to other underlying reasons for teacher shortages such as low salaries, student discipline problems, inadequate supply of subject teachers and principals faced with having to find substitutes. He argued that overcoming these factors would decrease teacher shortages, and hence the extent of out-of-field teaching in the schools.

Studies on out-of-field teaching

Since Ingersoll's (1999) early work, a number of studies have been carried out to investigate the issues surrounding out-of-field teaching. Jerald and Ingersoll (2002) indicated that a high percentage of out-of-field teachers taught the core subjects and not their specialised subjects in secondary schools in the United States. They argued that this problem became much worse between the periods 1993-1994 and 1999-2000, and added that the rates of out-of-field teaching were higher in the nation's lowest-income and highest-minority schools (Jerald & Ingersoll, 2002, p.1).

Seastrom, Gruber, Henke, & Cohen (2002) defined out-of-field teaching more strictly in Americans terms as 'a teacher without major, minor, and certification in a subject taught'. Meanwhile, Seastrom et al.'s (2002) study focussed on teachers' qualifications and the number of subjects taught by out-of-field teachers in secondary schools in the United States. The subjects in the middle school with the most out-of-field teachers were the Social Sciences, such as History, as well as Foreign Languages, English, and Mathematics. Meanwhile, in senior high schools, most out-of-field teachers were assigned to teach English, Mathematics, Social Sciences, Music, Arts and Physical Education. These findings highlight that out-of-field teachers teach mostly core subjects. From this study, it appears that what these teachers tended to teach was based on the textbook. As a result, student engagement and critical thinking in the specific subject were very limited (Ingersoll 1999, p. 29). Teaching based on the textbook could also result in difficulties in answering examination questions, because the standardised examination included critical thinking elements (Ingersoll, 1999). Brown (2003) reported the percentages of out-of-field teacher teaching History and the Social Sciences in the United States. He found that 71 percent of History teachers in middle schools lacked a college minor or similar qualification in History and another 11.5 percent lacked a college major in History (Brown, 2003, p. 2). The percentage of out-of-field teachers in middle school History and Social Science subjects was slightly higher than in the high schools.

McConney and Price (2009b) have been continuing to research 'the phenomenon of teaching out-of-field in Western Australia' (p. iv). Their results have indicated that out-of-teaching was a common and continuing practice in Australia. Although it was occurring across Western Australia, it was higher in the non-government schools. Moreover, a large proportion of out-of-field teachers had at least 20 years teaching experience (McConney & Price, 2009b p. 96).

Another study conducted by Dee and Cohodes (2008), focussed on out-of-field teachers and students' achievement. The study set out to determine the effect of subject-specific teacher certification and academic degree on teacher quality. A data set (Dee & Cohodes, 2008) from theNational Educational Longitudinal Study of 1988 (NELS: 88) was used in this research. The results indicated that there was no significant difference between subject-qualified teachers and other teachers in promoting students' engagement and comfort with their subject. However, subject-qualified teachers were more likely to view their students pejoratively in relation to homework and attentiveness. In the case of mathematics, out-of-field teachers reduced the achievement of the very weak students (Dee & Cohodes, p. 29).

A study recently carried out by Riordain and Hannigan (2011), investigated out-of-field teacher teaching in mathematics classrooms and the deployment of these teachers in Irish post-primary (secondary-level) schools for students aged 12/13 to 18. The samples were 324 mathematic teachers from 51 schools, 26,634 students, and 25 principals. The researchers found that there was no significant relationship between gender and teaching qualifications. Older teachers were more likely to have a teaching qualification in Mathematics. Compared to qualified mathematics teachers, out-of-field teachers were primarily assigned to non-exam year classes (Riordain and Hannigan, pp. 297-298).

In Malaysia, a research study of out-of-field teaching was carried out in 2003-2005 under a Ministry of Education research grant, The Intensified Research in Priority Areas (IRPA). This study involved 401 teachers in their first three years of teaching experience in the classroom following the completion of their teacher education program. The study investigated the relationship between teachers' subject specialisation and the subjects taught in school. The findings showed that out-of-field teaching was prevalent among the teachers in the study and that History was one of the subjects most affected (Aini Hassan & Wan Hasmah Wan Mamat, 2007). Out of 17 History teachers selected as respondents, only five (27%) had majored in History and 12 (73%) were out-of-field teachers.

Moreover, it has been claimed that out-of-fields teachers lack of subject background influences the quality of teaching and learning in the classroom Mc Conney & Price, 2011). According to Ingersoll, (2001), 'good teaching requires expertise in at least three areas; knowledge of a subject, skills in teaching and also pedagogical content knowledge' (Ingersoll, 2001, p.34). Besides this, in the area of History teaching knowledge and views about the nature of the subject are important because these shape teachers' views about what they should teach in the classroom (Wilson & Wineburg, 1988 cited in Wilson, 2001). In the present study, the focus was on investigating the differences between out-of-field and in-field History teachers in relation to students' perceptions of teaching and learning History in the classroom.

Alternative view on out-of-field teaching

The previous studies on out-of-field teaching discussed above revealed the negative aspects of out-of-field teaching. However, there are several studies that have advanced positive findings on this issue. Becker (2000) and Olitsky (2006) howed that more frequent used of the constructivist approaches to teaching and better student engagement existed in out-of-field teachers' classrooms compared to in-field teachers' classrooms.

Becker's (2000) findings identified that out-of-field teachers exhibited more constructivist approaches in their teaching. His research samples were taken from two categories of teachers: (a) teachers with a mixed academic load (subjects) and (b) teachers with a single subject academic load. He classified teachers as follows: category 1 teachers were engaged in out-of-field teaching, while category 2 teachers were engaged in in-field teaching. His research findings revealed that, on the basis of mean scores for constructivist approaches, teachers from category 1 demonstrated a more constructivist approach. compared to teachers from category 2. Moreover, the teachers who taught a very mixed subject load teaching consistently scored the highest on constructivist measures. (Becker, 2000, p.28).

Olitskys' (2006) study was on out-of-field Physics teachers who taught Chemistry in a Year 8 urban classroom, with students from diverse backgrounds. The results showed that more students participated in and enjoyed the Chemistry when the teacher was 'out-of field' (Olitsky, 2006, p. 218). In addition, from classroom analysis, Olitsky reported that there was a greater social distance between teachers and students when the teacher was in-field. Olitsky added that an in-field teacher mainly engaged in 'front stage' performances, projecting the role of an expert and hiding any struggles with the materials. In contrast, the out-of-field teacher engaged with the students in 'backstage' performances and openly struggled with the content. Additionally, these practices increased the interaction between the teacher and the students, and reduced the use of scientific language. Olitsky (2006) further added has that this approach encouraged solidarity and group membership between the teacher and students.

Based on research by both Becker (2000) and Olitsky (2006), out-of-field teaching may not be as problematic as has been suggested. Furthermore, their findings pointed to factors other than knowledge of the discipline area as influencing the quality of teaching in the classroom. One of these, conceptions of teaching, which underlies what teachers do in the classroom, is considered in the next section.

2.3 Defining Conceptions of Teaching

There is no widely accepted research definition of conceptions of teaching (COTs). Pajares (1992) argued that the absence of clearly agreed terminology had slowed down research in this area. This view was supported by Kember (1997), who claimed that a definition of the term was largely absent in research. However, it is important to distinguish between the terms 'concept', 'conception' and 'conceptual'. The definition given by The Shorter Oxford Dictionary (1933, p. 360) for 'conception' is 'that which is conceived in the mind (e.g.: ideas, notion)'. 'Conceptual' is defined as 'pertaining to or relating to mental conceptions or concepts', while 'concepts' means 'the product of the faculty of conception; an idea of a class of objects, a general notion'. According, to Delvin, (2006) terms such as conceptions, beliefs, orientations, approaches and intentions are frequently used interchangeably.

The most helpful explanation of what is meant by 'conceptions' is given by Pratt (1992, p.204) in his study of the adult educator.

> Conceptions are specific meanings attached to phenomena which then mediate our response to situations involving those phenomena. We form conceptions of virtually every aspect of our perceived world, and in so doing, use those abstract representations to delimit something from, and relate it to, other aspects of our world. In effect, we view the world through the lenses of our conceptions, interpreting and acting in accordance with our understanding of the world.

In the present study, the term conceptions has been defined as teachers' ideas and responses to the teaching and learning process in the History subject that they taught at secondary school. According to Pratt (1992), the conceptions of teaching can be viewed as teachers' differing ideas underlying their description of how they view teaching History knowledge (Goa, 2002).

Studies on Conceptions of Teaching

There are a few studies on the process of teaching in general. Fox (1993) identified four basic conceptions of teaching: (a) transfer theory which treats knowledge as a commodity ; (b) shaping theory which treats teaching as a process; (c) travelling theory which treats teaching as an academic subject to explore, with teachers as expert guides; and (d) growing theory which focuses on the intellectual and emotional development of the learners.

On the other hand, phenomenological research by Samuelowicz and Bain (1992) on teaching conceptions found five qualitative categories in conceptions of teaching. These categories were (a) supporting students' learning, (b) changing students' conceptions, (c) facilitating understanding, (d) transmitting knowledge and (e) imparting information. The same method was used by Prosser, Trigwell and Taylor (1994) with 24 academic respondents from the physics and chemistry departments of an Australian university. Their findings identified six conceptions of teaching: (a) transmitting concepts and syllabus; (b) transmitting the teachers' knowledge; (c) helping students acquire the concepts of the syllabus; (d) helping students acquire teachers' knowledge; (e) helping students develop concepts; and (f) helping students change their conceptions.

Kember and Gow (1994) further developed this approach by using quantitative methods to investigate the process of teaching and its relationship to students' approaches in learning. Their questionnaires were developed from responses to semi-structured interviews. This research postulated two categories of conceptions of teaching: 'learning facilitation' and 'knowledge transmission'. Learning facilitation focused on "the development of problem-solving skills, critical thinking, and independent learning" (Kember & Gow, 1994, p. 2). On the other hand, knowledge transmission was when teachers viewed "the knowledge of discipline or subjects [as] the primary requirement for an academic" (Kember & Gow, 1994, p. 63).

Kember (1997) further developed these as two main categories of conceptions of teaching that influence the teaching process. The first was teacher-centered/knowledge or content-oriented and second was student-centered/mind or learning oriented. Each one of these categories had subscales.

The teacher-centered or content-oriented conception is where the teacher's job is conceived of as knowing the subject and accurately and clearly imparting that knowledge to the students (Delvin, 2006). Its subscales were categorized as imparting information, ideas and relationships and transmitting structured knowledge that is consistent with a body of subject knowledge. In contrast, the student centered learning oriented conception focuses on students' learning and the teacher's role in facilitating this. It recognises the importance of structuring and arranging ideas and relationships in the minds of the students. The subscales developed related to facilitating understanding and conceptual change, as well as intellectual development (Delvin, 2006).

According to Kember (1997) and Kember and Kwan (2000), the link between these main categories can be regarded as student-teacher interaction as shown in figure 2.1.

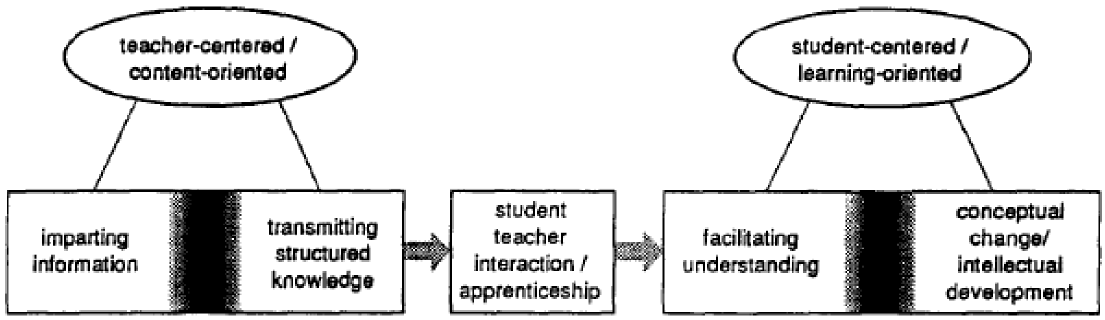

Figure 2. 1 Orientations and conceptions of teaching (Kember 1997, p.264)

This review of the scholarly research into conceptions of teaching has addressed the underlying beliefs and ideas which influence what and how teachers teach. Moreover, the literature has highlighted that the role of teachers is to support students and guide their learning through providing the constructs students need in order to understand the content (Eley, 2006). In relation to the subject area of History, these studies point to the importance of knowing what conceptions of teaching History are held by those teaching the subject and how these conceptions impact on their practice in the classroom.

Teachers' conceptions of History teaching

Studies in this field have examined the relationship between teachers' views about the nature of History and their ideas about teaching History in the classroom (Wilson & Wineburg, 1988; VanSledright, 1996; Evans 1988, 1989, 1990; Goodman & Adler, 1985). In these studies a range of different conceptions of History have been revealed. When Wilson and Wineburg, (1988) interviewed first year social science teachers, they found that History was generally perceived as factual by these novice teachers. For those teachers who majored in Social History, History was seen as interpretation, as well as fact, and the study of History was seen to be full of life, including music, art and drama. However, among non-History majors, teaching History was more often viewed as arcane, dusty and dull (Wilson, 2001). According to Wilson and Wineburg (1988), the different knowledge and beliefs of teachers influence what they do in the classroom; 'those who saw History as interpretative and exciting, craft instruction to communicate those aspects of discipline. And those who saw History as "the fact" or who had little historical knowledge had fallen into the age-old routine of uninspired History teaching' (Wilson, 2001, p.535).

In another study, which explored the relationship between teachers' conceptions of History and their teaching style, five conceptions of teaching History were found (Evans, 1990). The data were drawn from 30 teachers, with five teachers being interviewed and observed in-depth. He also interviewed the students of these five teachers.

Evans (1990) categorized these teachers into five types according to their conceptions of teaching History. These were:

- *Storyteller*, where *teachers'* talk dominated the classroom and storytelling (or narrative) was used as the common mode of communication.
- *Scientific* historian, who focused on historical explanation and interpretation, understanding historical processes and gaining background knowledge to understanding current issues, while encouraging students to engage in inquiry.
- *Relativist /reformer*, who emphasised the relationship of past problems to present ones.

- *Cosmic philosopher,* who saw generalisations as the most interesting aspect of History.
- *Eclectic* teacher who selected different emphases at different times.

These widely varying conceptions of teaching History were not regarded as exclusive categories. Rather each category emphasised different purpose for the study of History. Evans (1990) concluded that teachers' conceptions of History seemed to be related to their background, beliefs, and knowledge. But, he cautioned that other factors such as organisational constraints and models of teaching could have an impact on teaching styles and teachers' conceptions of History.

Wineburg and Wilson (1991) undertook in-depth interviews and observations with 11 experienced high school History teachers, with the purpose of capturing, and describing what these teachers knew, thought and did. Comparing the case of two teachers, Price and Jensen, as examples, they claimed that both of these teachers presented subject matter in two ways, namely, by focussing on epistemological issues (the way of knowing History) and, on the other hand, on contextual issues (specific concepts, ideas and events). Both teachers presented subject matter in a way that helped students to see the complexity of historical understanding. Although their teaching differed, both of them had considerable subject knowledge. Their teaching was shaped by their views of History as well as by their knowledge and understanding of what students knew and cared about, what curricular resources were available and what parents expected of the school. This study highlighted the way an individual teacher's knowledge and beliefs were able to shape teaching in the classroom.

As a result, it is essential to better understand how teachers' conceptions of History teaching can influence students' approaches to learning History. The next section considers what makes History teaching effective in the classroom.

Characteristis of Effective History Teaching

The literature suggests that effective History teaching involves the teacher and students focusing on knowing History (subject-matter), 'doing' History (historical inquiry), and 'scaffolding' the learning of History through their pedagogical knowledge and skills. To 'do' History involves analysing evidence in order to represent past events, considering perspectives and context, going beyond the written words to understand the intentions, motives, plans and purposes of an author so as to build understanding of the historical significance of the events concerned (Hover & Yeager, 2003). Scaffolding refer to the teaching supports that facilitate learning when students are first introduced to new subjects or concepts (McKenzie, 1999; Bransford, 2000; and Baneszynski 2000).

One of the characteristics in effective History teaching is the teachers' recognition of History as a unique subject. History is about inquiring into and representing human experience of the past. Teachers need to have a good knowledge of the subject matter to enable them to analyse curriculum material and to transform it into suitable teaching material (National Education Blueprint, 2007; Garner & Mansilla; 1994, Yilmaz; 2008). Moreover, Yilmaz (2008) suggested that the History teacher also needed to have a strong understanding of the conceptual foundation of the discipline. Teachers should have historical knowledge and skills in order to encourage and help the students in the History classroom to understand the past.

Historical inquiry engages students in actually doing History. Levstik (1996) and Levstik and Barton (2001), suggests it involves students in posing questions, collecting and analysing sources,so that by the end of the process, students build their own historical interpretations. In doing History with a group of students, an effective teacher presents History as a constructive activity that historians do, working with raw materials, in order to tell the past, and understand the present.

Content knowledge is essential for History teachers (Shulman, 1987). This view is supported by VanSledright (1997) who suggested that applying subject knowledge in the classroom meant approaching History effectively from the inside out. In doing this, teachers would structure lessons in the classroom, by asking historical questions, while students would adopt historical inquiry skills, such as investigating, scouring, reading, and analysing evidence. As they answered the questions given by their teachers, they would develop their own interpretation of events. To be able to 'do' History with their students in this way, teachers must understand the content knowledge involved in History methodology.

Teachers with greater subject content knowledge are also able to involve students in discussion that goes beyond text book content, to ask higher-level cognitive questions, and to guide students to work on their own directed activities (Carlsen 1987; Carlsen & Wilson, 1988; Dobey & Schafer, 1984; Hasweh 1985 cited in Covino & Iwanicki, 1996). Clearly, content knowledge is a major factor in effective History teaching in schools. Teachers who know the content knowledge are able to deliver the subject more effectively. In addition, to knowing the content knowledge, understanding historical inquiry is of major importance for teachers. Embedding inquiry into History teaching involves students analysing evidence from various sources (e.g. archives, texts) in order to construct a representation of past events, thereby going beyond the written word and building understandings of historical significance (Hover & Yeager, 2003).

Pedagogical content knowledge is another factor that influences teachers' competence in helping their students to learn History. According to Shulman (1986, p. 9), pedagogical content knowledge 'goes beyond knowledge of the subject matter per se to the dimension of subject matter knowledge for teaching'. Teachers need knowledge of the various strategies to extend the understanding of students in the classroom and overcome misconceptions (Shulman, 1986). This view is supported by Seixas (1999, p.313), who suggests that subject matter by itself is inert knowledge, while pedagogy is concerned with the means of its 'delivery'. Furthermore, Yilmaz (2008, p.43) suggests that:

> The more knowledgeable a History teacher is about pedagogical content knowledge, the more likely it is that he or she is going to adjust curriculum and instruction to students' abilities, learning styles, pedagogical preferences, needs, interests, and cultural background.

A teacher's great responsibility is to help students to structure learning; this is built up slowly in the process called scaffolding discussed earlier (Levstik, 2000). Effective History teachers are able to scaffold learning in the classroom by constructing a context for historical inquiry which helps to motivate learning. Such teachers are also able to connect current knowledge with new knowledge while teaching in the classroom. As an educator, a teacher should develop students' understanding of historical evidence and interpretation, and through scaffolding, encourage deep knowledge of History. Having strong pedagogical content knowledge skills seems to be a prerequisite for History teachers (Keith, 2004), but it needs to be complemented by classroom strategies for teaching.

Methods in Classroom Teaching

In general, teachers have built up their conceptions about teaching (discussed in an earlier subsection) from personal experiences in their own elementary to university level education (Peeraer, 2011; Dall'Alba, 1990; Fox, 1983; Martin & Balla, 1991; Pratt, 1992; Prosser, Trigwell & Taylor 1994; Ramsden, 1992; Samuelowic & Bain 1992). In the classroom they teach their own students using a variety of practical methods and activities, which are consistent with their conceptions of teaching, to deliver the subject content knowledge.

Recently, Trigwell (2012), investigated the relationship between teachers' emotions and their method of classroom teaching in various courses in higher education. The 175 participants were all teachers in the Australian higher education sector. Two self-report questionnaires were used: (a) Approaches to Teaching Inventory (ATI-R), and (b) The Emotions Teaching Inventory (ETI). These questionnaires were used to obtain the information on the following themes: different approaches to teaching (conceptual change or student focused (CCSF) and information transmission or teacher focused (ITTF); teachers' emotional experiences (positive emotions: motivation, pride, confidence, satisfaction and happiness; negative emotions: anxiety, embarrassment, frustration, boredom and annoyance). The researcher found that there were relationships between the approaches to teaching their courses and their emotions about teaching it. Teachers did experience both positive emotions (motivation and pride) and negative (anxiety and embarrassment) in their teaching. The positive emotions were associated with those respondents who had

CCSF approach to teaching. On the other hand, the negative emotions were associated with teachers having the ITTF (Trigwell, 2012).

A another study carried out by Zerihun, et al. (2011), in the Department of Psychology at University of Mekelle, Ethiopia, focussed on teachers' approaches to teaching and students' learning, and teacher conceptions of the meaning of teaching. The data were collected through survey questionnaires. Two questionnaires were designed, one for teachers and one for students. A total of 434 respondents from students and 43 respondents from teachers were used for the analyses. The results indicated firstly that teaching was seen as predominantly teacher-centred. Both teaching and learning activities evolving from this orientation. This meant that, the teacher was transmitting knowledge rather than facilitating student learning. Secondly the teacher was regarded as the provider of information. Both set of participants indentified effective teachers as those who showed the following characteristics: knowledgeable, punctual, organised and good at communicating (Zerihun, 2011).

Kember and Leung (2005) conducted a large scale study on 2,548 full-time and part time students in a Hong Kong university to examine the relationship between teaching approaches, student teacher relationships and student outcomes (learning, working together, and intellectual outcomes) (see the path diagram in Kember & Leung, 2005, p. 165). The researchers found a significant relationship between the teaching approaches and other variables. The results indicated that there was a mutually reinforcing effect from good teacher-student relationships (Kember & Leung, 2005, p. 115). Moreover, the effect of teaching approaches on students markedly outweighed the weaker influence of the wider university environment. Finally, the study revealed that students with different modes of enrolment (full-time as compared to part-time) experienced different types of teaching approaches (Kember & Leung, 2005, p. 166).

Lindblom-Ylanne, Trigwell, Nevgi, and Ashwin (2006), in a study carried out on teachers from the University of Helsinki, investigated the relationships between their approaches to teaching, their self-efficacy belief, as well as the effect of teaching contexts, on approaches to learning. The research stated that 'there is evidence that teachers' approaches to teaching are connected with their conception of teaching' (Lindblom-Ylanne et al., p. 286). Findings showed that teachers who experienced different contexts adopted different ways of teaching. Teachers from different disciplines also used different approaches to teaching. In particular, teachers from the 'hard discipline' areas (physical sciences, engineering, and medicine) adopted teacher focussed approaches. In contrast, teachers in the 'soft discipline' areas (social sciences and humanities) were more student-focused (Luedddeke, 2003 cited in Lindblom-Ylanne, et al., 2006). There was no significant difference in self-efficacy belief of teachers across the disciplines. The researchers concluded that encouraging teachers to adopt more student-centred approaches could be triggered by a focus on courses regarded as less mainstream (Lindblom-Ylanne, et al., p. 295).

Trigwell. et al., (1999), examined a group of 46 science teachers and their students (3956) to determine the relationship between teachers' approaches to teaching and students' approaches to learning. Furthermore, this study also included links between these factors and student learning outcomes. The results revealed that teachers who employed an information or teacher-focused approach to classroom activities were likely to be teaching students who reported adopting a surface approach to learning in the classroom. This result also affirmed that surface approaches to learning were related to lower quality learning outcomes, as the previous research had revealed (Trigwell, et al., 1999, p. 66).

A number of other studies have shown no relationship between approaches to teaching and students' learning. Selcuk (2010), for example, investigated the effects of the Problem Based Learning (PBL) method on pre-service teachers' achievement, and learning approaches and attitudes towards, physics. The respondents were 46 pre-service students teacher in Turkey. The findings suggested that the adoption of the PBL teaching approach had encouraged student learning and improved student interest in physics.

A similar study was carried out by Kek and Huijser (2011) on the combined relationships of student and teacher factors on learning approaches and self-directed learning readiness. The samples were 392 students and 32 teachers from one of the public universities in Malaysia. A Problem Based Learning (PBL) approach was employed in 44 classrooms. The researchers revealed how and what individual student factors and teacher factors influenced students' learning approaches and related learning outcomes (Kek & Huijser, 2011, p. 190).

Another study, carried out in the Netherlands by Torenbeek,Jansen, and Hofman (2011, pp. 364-365). They investigated the approaches to teaching at secondary schools, their relation to students' perception of the fit between school and university, and their first year university achievement. The data were collected using a questionnaire for teachers and students and an interview for school management. The results indicated that the approaches to teaching at secondary school impacted on first-year university results and the perceived fit for students enrolled in soft sciences. Students who experienced teacher-centred teaching in secondary school performed well in university compared to students who were exposed to student-centred learning. The long-term effect of a certain approach to teaching in secondary schools might be different from any short term effects evident in students' development. The effect of student background characteristics was found to be important, in addition to the effect of teaching approaches.

Another recent study investigated (a) what teachers of undergraduate medical programme in University of Antwerp, Belgium thought about their own learning; (b) how they approached their teaching; and (c) the relationship between their conceptions of learning and their teaching approaches (Peeraer, Donche, De Winter, Muijtjens, Remmen, Van Petegem, Bossaert , and Scherpbier 2011, p. 33). It was found that teachers in this programme had a variety of conceptions of their own learning (COL), but no significant correlations were found between COL and their approaches to teaching (Peeraer, et al., 2011, p. 32).

The following section discusses other studies that focussed on students' approaches to learning.

2.4 Students' approaches to learning

Students' approaches to learning were originally conceptualised by Marton (1975, cited in Biggs & Moore, 1993) in the context of student literacy. He found two types of learning approaches: surface and deep learning. A surface approach was related to lack of interest of subject matter, so that students with this approach tended to memorise facts. Meanwhile, the deep learning approach was when students sought to understand the underlying meaning of the learning task.

Biggs (1987) extended Marton's work by focusing on different aspects (Biggs & Moore, 1993). Biggs proposed that the students' learning approaches were a mixture of motives and associated strategies. He identified three types of motives as follows: deep, surface, and achieving (Biggs, 1987). A student who used a surface approach to learning tended to memorise or rote learn, in order to reproduce the material given, while in the deep approach to learning, students attempted to seek meaning for themselves and to understand the materials. According to Dart (1997), a deep learning approach was associated with a constructivist teaching stance, which emphasised that learners actively construct knowledge. On the other hand, the surface approach to learning was connected to learners' passive reception of teaching (Dart, 1997). In the achieving approach to learning, students were motivated by achieving high grades, and responded by organising their time to get the best results. This approach included a mixture of deep and surface approaches to learning, but only for the purpose of maximising assessment results.

Biggs (1987) developed the Learning Process Questionnaire (LPQ) and the Study Process Questionnaire (SPQ) to assess how students at secondary school and tertiary level approached their learning tasks in general. The questionnaire was based on his motivation and strategies model.

Entwistle and Ramsden's (1983) subsequent research on students' approaches to learning found a fourth type of students, the non-academic, who really represented failure to learn. Ramsden (1992) claimed that the deep approach involved reading for understanding, active processing of information and making connections between previous knowledge and current information. In contrast, surface learners used rote learning simply to retain the information. Meanwhile, in the achieving approach to learning, students focused on a studying strategy that would maximise results. In case of students with a non-academic approach to learning, they lacked motivation, were negative in attitude, and disorganised (Entwistle & Tait, 1990). Other studies, however, found that students' approach to learning was not fixed, but flexible (Booth, 2003). Students could change their approach depending on the context. The main influence on student approaches in the educational environment was established by the instruction provided by teachers in the classroom (Booth, 2003).

A series of studies by Biggs' (1978, 1985, 1987) confirmed that the personal characteristics of students and their learning context were the essence of Biggs' conceptualization of students' learning approaches. In developing and validating the Study Process Questionnaire (SPQ), Biggs (1985 & 1987), used a huge sample of students' data and range of contextual and personal characteristics as independent variables. The variables used in SPQ were gender, age, year of study, parents' education background and academic stream (Arts/ Science). The results indicated that females scored lower than males on the surface learning approach and higher on the deep learning approaches. In terms of age, younger students were more likely to adopt a surface approach compared to the older students. Years of study had a strong positive effect toward deep and achieving learning approaches. In addition, the results showed that students from the Arts and Education disciplines were high on the deep learning approach, in contrast to Science students who were low on the deep learning approach.

A number of other researchers found that there were relationships between deep approaches to learning and student perceptions of the teaching context (Kember & Gow, 1994; Dart, 1994; Kember & Wong, 2000; Leung & Kember, 2003). Their results highlighted some factor in teachers' qualities that were associated with students' deep approach to learning. These qualities were identified as being a motivator; encouraging interactive learning; providing pastoral care; and using a variety of teaching methods. Leung and Kember (2003) claimed that if students were given the opportunity to reflect, to explore and to think about their work, it would encourage the deep approach to learning in the classroom.

Similar findings were obtained by Lizzio, Wilson, and Simon (2002) in a study investigating the relationship between students' approaches to learning and their classroom environment. The researchers found that the classroom environment was not the only influence on students' learning approaches. The findings from Lizzio and associates revealed that a heavy workload and inappropriate assessment would lead the students to employ a surface approach to learning. In contrast, that students were encouraged to use deep approaches where they perceived the learning environment to be interesting and motivating, and were given appropriate workloads and assignments. These researchers provided five important suggestions for a quality teaching in the classroom. First, 'the staff show an interest in students' opinions and attempt to understand the difficulties students may be having; second, express positive expectations and seek to motivate students to do their 'best work'; third, provide clear and useful explanation of ideas; fourth, work to make subjects interesting and finally provide feedback on progress' (Lizzio et al., 2002, p. 50).

Another study, carried out by Furnham, Christopher, Garwood, and Martin (2007) focussed on personality factors, general knowledge and approaches to learning. Three types of questionnaires were used in this study. The first was Irwing's General Knowledge Test (Furnham, et al., (2007), with 72 items that measured knowledge of six areas: literature, general science, medicine, games, fashion, and finance. The second was The NEO

Personality Inventory - Revised (NEO-FFI; Costa & McCrae, 1985, 1992, cited in Furnham, (2007), that measured the 'Big Five' personality factors: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The third questionnaire was The Study Process Questionnaire (SPQ) (Biggs, 1987), which investigated three learning approaches: Deep, Surface and Achieving, which were broken down to two components: learning motives and learning strategies. In total there were six factors for analysis: deep motive, deep strategy, achieving motive, achieving strategy, surface motive, and surface strategy. The results found that older males scored higher, compared to females, on the general knowledge score. Moreover, both age and gender were significant predictors of general knowledge, that is, as people got older they increased their general knowledge, due to activities such as reading and remembering more. In terms of personality, the results revealed that there was no significant difference between five sub-scales that were tested as predictor variables of learning approaches. The researchers did found that the relationship between openness and achievement in general knowledge was mediated by a deep approach to learning.

According to Baeten, (2010), student characteristics such as age, personality, methods, motivation, self- confidence and self-efficacy all impacted on students' learning, as well as teaching. Furnham et al., (2007) affirmed that age and personality are both factors which are not able to be manipulated. As students grow older and their personalities are moulded by 'Big Five' factors (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) they seem more likely to adopt deep learning approaches.

From the above discussion of research studies, it is clear that demographic personal variables such as age and gender, as well as teacher and student characteristics, are related to students' approaches to learning. These influence students' motivation to learn for understanding and engage in learning in the classroom. Another important factor feeding into this is students' perceptions of the classroom learning environment.

Students' perceptions of classroom learning environment

Studies on classroom climate or learning environment have been carried out to investigate its effect on students' learning at secondary and university level (Fraser, 1991) and its influence on their learning approaches (Ramsden, Martin, and Bowden, 1989; Dart, Burneet, Purdie, Boulton-Lewis, Campbell, and Smith 2000).

Students' perceptions of their preferred and actual learning environments in their classroom varied. Yuen-Yee and Watkins (1994) found that students in one Hong Kong secondary school preferred their classroom environment to be safe and supportive, encouraging active participation in the learning process, and incorporating investigation skills in learning science in the classroom. Previous research results had showed that such an environment promoted a deep approach in student learning. However, students also perceived that in fact, their classroom was relatively competitive, teacher controlled and encouraging of rote-learning. It was shown in this study that students preferred a friendly classroom learning environment where teachers and students could work together to develop better activities in the classroom. A classroom perceived to be high in such personalisation was likely to promote deep learning.

MacAulay (1990), discussed four domains, (a) structure and organization, (b) cognitive process, (c) student characteristics, and (d) teacher characteristics, in her review of the classroom environment. MacAulay's (1990) study was based on the Moos (1980) framework. The influence of each domain was examined separately and discussed. The findings indicated that structure and organization - the physical features in the classroom - could influence students' outcomes. Cognitive process - the self-management techniques designed to encourage a democratic classroom environment - when tested in the classroom, promoted students' schooling achievement.

Student characteristics - the students' preference for a co-operative climate compared to a competitive climate. Furthermore, the students were more motivated in learning and achievement in the former. Teacher characteristic - teachers who were friendly, supportive, warm, and communicative - were preferred by the students, who considered that such teachers increased their learning outcomes and enhanced the emotional climate in the classroom. The results of this study indicated the importance of the teacher's role in motivating and improving the learning experiences of the student. In the students' point of view effective teaching depended on the personality of the teachers.

Fraser (1998) used five dimensions, namely personalisation, participation, independence, investigation and differentiation, to examine the nature of the classroom learning environment in the classroom and its influence on students' characteristics and students' experiences. His findings showed that students' perceptions of the classroom environment influenced their approaches to learning and the quality of their learning outcomes (Fraser, 1989; 1998).

A similar view was put forward by Dart et al. (1999) who concluded that students who perceived the classroom environment as cohesive, having order and organisation, and encouraging participation, and clear goals were likely to show higher levels of achievement.

Dart's study of the relationships between students' perceptions of the classroom environment, approaches to learning and self-concept as a learner, was carried out in Australia, using the Individualised Classroom Environment Questionnaire (ICEQ) and the Learner Self Concept Scale. The results indicated that there was a significant relationship between the deep approach to learning and a classroom environment, which students perceived to be highly personalised, encouraging active participation in the learning process and developing investigation skills in learning. On the other hand, the surface approach to learning had negative associations with classroom environment and learning approaches, because students who employed surface approach to learning indicated lower levels of personalisation, participation, and investigation in the classroom learning.

In subsequent research, Dart et al. (2000) tested the relationships between student conceptions of learning, their perception of the classroom environment and their approaches to learning, using structural equation modelling. They found important relationships between the variables. The findings showed that the deep approach to learning was promoted by the teachers, when the students perceived that the classroom environment was safe and supportive. Furthermore, in this environment, teachers could use several methods (exploration, inquiry and experiments) for problem solving. This research also found that deep learning could be facilitated by the daily experience of such activities. However, Dart and associates added that student skills and willingness to learn were essential, as well, to improve learning. It can be concluded that learning strategies which nurture deep learning in the classroom, are required in building up a positive classroom environment.

Evans, Harvey, Buckley, and Yan (2009) also perceived classroom climate as a multi-faceted concept which comprised various dimensions. According to Evans et al. (2009) there were three different components in classroom climate (a) academic, (b) management and (c) emotional. Their research focused on emotional climate, for which they identified five components: (a) emotional relationship, (b) emotional awareness, (c) emotional coaching, (d) emotional intrapersonal belief, and (e) emotional interpersonal guidelines. Evans et al. (2009) suggested that it was essential to treat emotional climate as a separate aspect of the classroom climate because it was superior to other classroom climate domains in interfacing with the academic and management elements in an effective learning environment. In this sense, they claimed that emotional climate could be regarded as an aspect of all teacher-child interaction, rather than a separate component of the classroom environment. The results also indicated that there were relationships between classroom climate and students' cognitive, social, and motivational development. Furthermore, Jennning and Greenberg (2009) (in Evans et al., 2009) considered that the emotional climate depended on teacher's competence emotionally and socially, when dealing with complex interactions involving all students in the classroom. Therefore, Evans and his associates suggested that the most important factors in the classroom environment were the teachers' instructional style and classroom management. He added these factors were a function of the emotional relationship between teacher and students.

There are very few studies on the students' perspective of the classroom environment in History teaching. According to Ylijoki (1994), intrinsic interest in choosing History as a course in the university was one of the factors that influenced students' positive approaches to learning. The implication is that students should have an interest in subjects they choose because it can affect their performances (Booth, 2003). However, the situation is different in the Malaysian secondary school context since History is a compulsory subject. Students' interest in History, however, can be sustained if teachers play their role effectively. In particular, the way which in History is taught is important for sustaining a deep approach to learning. Both students and teachers in History have the responsibility to form a suitable classroom environment in order to expand the deep approach to learning among the students. Students have responsibility to do the preparation, and the teacher's task is to facilitate the discussion (Booth, 2003). The variety of methods that a teacher can use is another possible factor that affects the students' perception of learning History in the classroom. Using primary sources, novels, maps, cartoons, films, videos etc can make a History lesson come alive. In addition, using different teaching pedagogies also could accommodate variation in students' learning styles (Booth, 2003). This view is supported by Hayden, Arthur, And Hunt (1997, p.201) who suggested that 'resources certainly help students to be active in learning and can often play a significant part in motivating them to do well in History'.

Overall, the research studies reviewed were more on the university setting rather than the school, with focus on the science subjects more than History. Furthermore, the review revealed that little classroom research related to classroom environment has been published in the Malaysian context. However, the findings from the range of literature reviewed confirm the key variables which influence the way teachers teach and students learn in the classroom. The following section discusses the Biggs's 3P Learning Model as the theoretical framework used to guide this present study, as well as various Research Modelling Approaches that can be used for data analysis.

2.5 Theoretical Framework

Biggs' 3P Model of Student Learning

The initial purpose of this research was to investigate the differences between out-of-field and in-field teachers in relation to students' learning of History in the classroom. The models reflect the relationships between the variables discussed in this study. This study was guided by the Biggs' 3P (Presage, Process, and Product) theoretical framework for understanding students' learning through the relationships between what teachers and students think and do, and the nature of students' outcomes. The relationships in the Biggs's 3P model among these variables are shown in Figure 1.

The Biggs' 3P Model has been adopted as the theoretical framework for this research because it shows clearly how students' learning outcomes are influenced by students' own personal characteristics, interacting with teacher characteristics and the teaching context through the learning activities of the classroom. Put another way, Biggs' 3P Model of Student Learning, describes three points in time as they relate to learning: presage (personal and situational factors), process (activities in the classroom) and product (student learning outcomes) as represented in Figure 2.2 (Biggs 2003).

This theoretical framework is particularly appropriate for a study that seeks to examine the relationship between the characteristics and qualifications of History teachers and their students learning outcomes in History in Malaysian secondary schools. In the discussion of the three time points that follows, the variables under each factor have been conceptualised in terms of the present study.

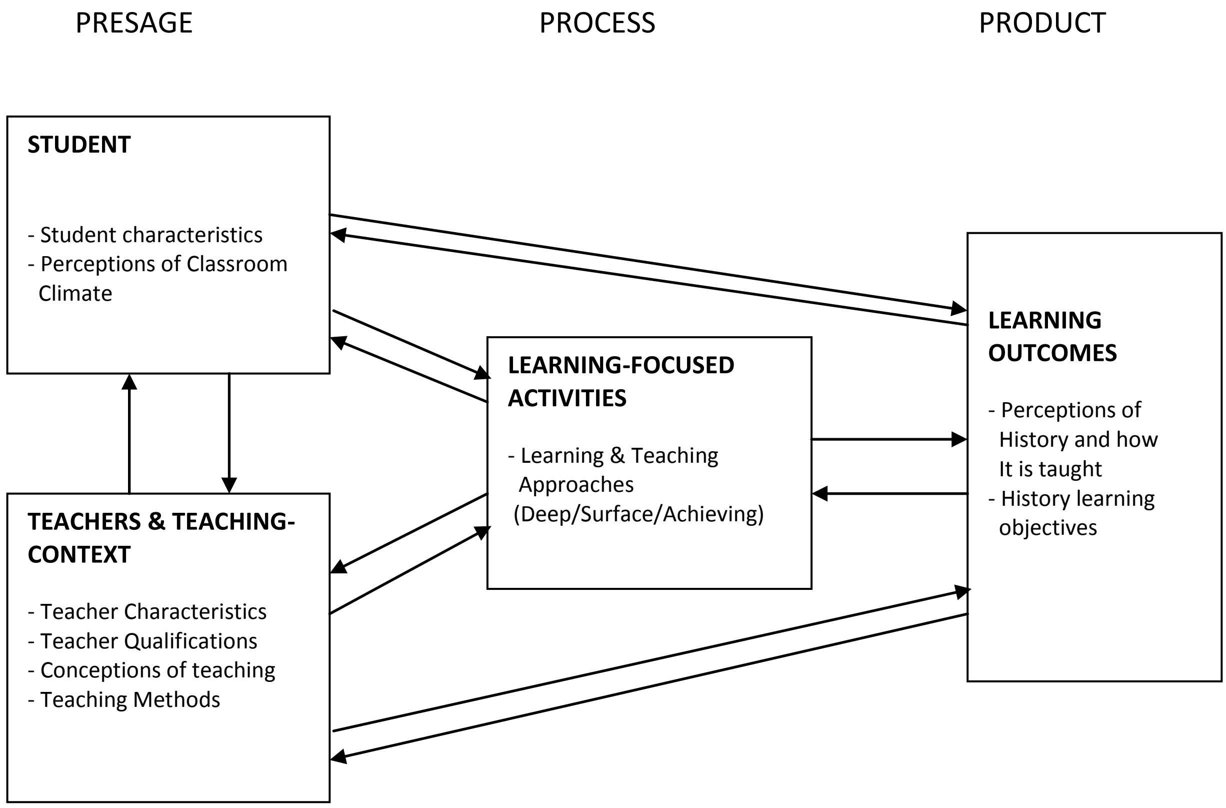

Figure 2. 2 Adapted from Biggs (2003).Theoretical Framework based on Biggs' 3P Model of Student Learning

Presage factors are the pre-existing factors that influence students' learning outcomes. Generally there are two categories of presage factors: students characteristics and teacher factors. In the context of this research, the first category has been conceptualized to include students' characteristics, and perceptions of classroom environment. The second category includes teacher characteristics, teacher qualifications, and conceptions of teaching in general, as well as the more specific factors of teachers' conceptions of History teaching, and Teaching Methods.

Process factors are the result of interactions between the presage factors of students and teachers in classroom learning activities. This interaction influences the students' immediate and ongoing approach to a particular task. Whether students manage the learning task with deep, surface or achieving approaches depends on their perception of teachers' presage factors, such as teaching characteristics and teacher practices, and teaching conceptions. A learning approach is considered deep when students seek in-depth meaning and understanding of the material being studied. In this approach students are actively constructing knowledge for themselves. This is because, according to Biggs and Moore (1993), Dart (1997), and Tang (1998) the deep approach is associated with constructivist learning. In contrast, the surface approach to learning is related to rote learning, which is in line with the traditional transmission model of teaching. In this approach students receive knowledge from the teachers and respond passively (Biggs & Moore, 1993; Dart, 1997; Tang, 1998). In the case of the achieving approach to learning, students become focussed on a studying strategy that maximises results for the purpose of ego enhancement, excelling in organized activities and cue-seeking behaviours (Dart et al., 2000).

Product factors refer to the outcomes achieved of student learning. According to Biggs and Moore (1993), the quality of outcomes is partly influenced by the learning approaches adopted by the students. Poor quality outcomes are mainly associated with surface learning approaches, while high quality outcomes are associated with deep learning approaches. It is important to recognise that for this investigation learning outcomes are gauged or measured not by objective marks related to students' achievement level in tests on examinations. Rather, in this study the learning outcomes refer to students' perceptions of History and how it was taught, as well as how far History learning objectives were being achieved in the classroom.

Biggs' 3P Model of students' learning outcomes has a dual base of presage factors, recognising the importance of inputs from both students and teachers. In this study the Process stage operates between teachers and students as they interact in the learning of History in Malaysian classrooms. It was expected that the results would highlight the influence of students' different personal and situational backgrounds on the final learning outcomes. Understanding these factors is important for teachers striving to improve their own pedagogical practices.

Nevertheless, the main focus of this study was to test a model to investigate how teacher factors affect students' learning outcomes. In particular, the study sought a better understanding of how effectively teachers function in the history classroom, especially out-of-field as compared to in-field teachers. The judgement on this issue came from the students' perspective. Their perceptions on the subject, History, and the quality of their learning in the History classroom were used to measure students' learning outcomes.

Keeves's Modelling Approach Applied to Research Data

Keeves (2002) recommended that it is essential to adopt a Modelling Approach to the accumulation of knowledge both in regard to personal learning and to research investigations. Moreover, once developed, models must be tested and evaluated for their 'coherence and adequacy' (Keeves, 2002, p. 114).

Keeves considered that both individual and corporate knowledge must be tested not only for coherence, but also against evidence obtained from the real world in which human beings are living and undertaking their inquiries (Keeves, 2002, p 115). To do this, it is essential to develop a model for testing, beginning with the expression of the key relationships in propositions or hypotheses. The hypotheses then require structuring into a model which can be formulated for testing.

There were five types of models recognized by Keeves (1997, pp 388-390): (a) analogue models, (b) semantic models, (c) schematic models, (d) mathematic models, and (e) causal models. However, these models could have limitations, as Keeves (1997, p.121) pointed out, through 'oversimplification and inappropriate signification in which significance is attached to inappropriate aspects of a model rather than reveal the structural aspect of importance'.

Causal Model

The Causal model has been employed to guide this study. The causal model was introduced in the field of educational research in the early 1970s. Originally, this model was used in the field of genetics and linked with the analytical techniques of path analysis. Through the work of Burks (1928), Parker (1971) and Blalock (1961) (cited in Keeves, 1997), the causal model was made available for use in the educational field. In general, the model is the combination of the principles of path analysis and a set of structural equations. The idea underlying this model is constructing a 'simplified structural equation model of the causal process operating between the variables under consideration' (Keeves, 1997, p 391).

Keeves added that, in the modelling approach, logic and statistics are used to test the sufficiency of the model. Besides these, testing of the model can also be carried out using controlled observation, experimentations or systematic collecting of evidence from the real world (Keeves, 1997, p 121). Finally, the model can be evaluated either as acceptable or unacceptable from the results of the test. In this study, Biggs' 3P conceptual framework for learning outcome in education has been developed into a causal model, and tested using Structural Equation Modeling (SEM) and Partial Least Square Path (PLSPATH).

In this study the causal model was used to guide the collecting and analysing of the quantitative data. The conceptualizations of relationships were derived from the literature and empirical evidence from previous studies. How this model shaped the current study is explained below. There are a number of presage, process, and product factors in this study: (a) teachers' and students' characteristics, (b) learning process, and (c) learning outcomes. The relationship between the factors can be illustrated as follows (a) → (b) → (c). The causal model used in this study is in line with its purpose which is to measure the direct and indirect influence of each variable that is involved in this study and also to investigate the variability of effects from each particular cause. Furthermore, the teachers' and students' characteristics have the potential to be treated as one or more causes of particular affects in the teaching and learning of History in the classroom. All variables used in this study can be tested statistically using statistical procedures such as Path analyses and structural equations modelling (SEM) to check the significance and magnitude of the relationships between the causal and effects. This procedure is discussed in detail in Chapters 7 and 8.

2.6 Summary

The discussion of previous research studies related to this topic began with a specific and quite narrow focus - the nature of out-of-field teaching and its impact on the classroom teaching of History in Malaysia. Out-of field teaching was defined as teachers who do not have a university degree in History or teachers who do not hold a tertiary major or minor qualification in History education (Ministry of Education, 1991 cited in Aini Hassan et al., 2007). It most often occurs as the result of mis-assigned teachers (Harris and Jensz, 2006) or insufficient supply and training (Ingersoll, 2002). While previous studies indicated that teacher qualifications had a significant relationship with student achievements, (OECD 2005, 2009, Goldhaber & Brewer, 2000), none had actually investigated out-of-field teachers at the school level and the relationship of their teaching to students' learning of History in the classroom. A review of studies influencing classroom teaching and learning highlighted the importance of conceptions of teaching and their influence on students' approaches to learning, factors in effective History teachings and students' perceptions of classroom climate.

The last section of the chapter described Biggs' 3P Model of student learning as the chosen framework of variables for this study and out-lined how it was adapted to this research topic. In addition, the importance of the Modelling Approach to data collection and analysis was explained. The choice of the Causal Model, which used Structural Equation Modeling (SEM) and Partial Least Square Path (PLSPATH) analysis to test the relationship between variables was justified. The results of this research were expected to enhance understanding of how the teacher factors identified interact with student factors to influence student perceptions of teaching and learning in the classrooms of in-field as compared to out-of-field teachers. The next chapter discusses the methodology of the research in detail.

Chapter 3 Methodology

3.1 Introduction

In this chapter, the setting up of the research is explained in relation to the method and the questionnaires used. There is an outline of the approval process in Adelaide and Malaysia, together with a description of the pilot study carried out. A detailed discussion follows concerning the sampling process in the selection of the respondents and the procedures used for data collection. Finally, the chapter discusses the statistical analysis techniques employed to confirm the validity of the instruments by testing the fit of the various models related to the theoretical framework, proposed at the end of Chapter 2. In addition, the Partial Least Square (PLS) and Hierarchical Linear Modelling (HLM) statistical techniques used for testing the relationships between the factors in the study are explained.

3.2 Method used in this study

This research adopted a quantitative research survey method. The data were gathered by using survey questionnaires. Statistical analyses were employed to investigate the trends of the responses given and to test the research questions (Cresswell, 2008). In addition, correlational research design was employed. According to Creswell (2008), this design enables the researcher to test and describe the degree of relationship between two or more variables or sets of score. In this study, quantitative methods were used to investigate relationships between teachers' conceptions, methods and teaching approaches and students' approaches to learning History, their classroom learning climate, and History learning outcomes.

3.3 The Questionnaires

This section describes the instruments that were used in this study. There were two sets of questionnaires used, one for the teachers (refer to Appendix 1) and another for students (refer to Appendix 2). Each set of the questionnaires had three parts as follow:

Teachers' questionnaire:

- Teachers Conception of Teaching by Gao & Watkins (2002).
- Approaches to Teaching Instruments (ATI) by Trigwell, Prosser & Ginns (2005)
- History Teaching Method (self- developed)

Students' Questionnaire:

- Individualised Classroom Environment Questionnaire (ICEQ) by Fraser (1990)
- Biggs's Learning Process Questionnaire (LPQ) by Biggs (1987)
- Students' Perception of History (self- developed)

The first two parts in each set were standardised and validated instruments that have often been used in educational contexts but needed Confirmatory Factor Analysis (CFA). The third parts in each set was developed by the researcher specifically for this study. It therefore required validation through Exploratory Factor Analysis (EFA) and CFA.

Each of the above questionnaires is discussed in subsequent sections, with those for teachers being considered first.

Teachers' Conceptions of Teaching

The School Physics Teachers' Conceptions of Teaching (SPTCT) instrument was adapted to investigate History teachers' conceptions of teaching in this study. Gao and Walkins (2002) developed this instrument to assess teachers' conceptions of teaching among a large sample of Physics teachers in order to discover the relations between teachers' conceptions and student learning.

This instrument consisted of 37 items. Each item expressed teachers' opinions or ideas about teaching and learning. SPTCT measured five scales, namely, knowledge delivery (KD), exam preparation (EP), ability development (AD), attitude promotion (AP) and conduct guidance (CG). These scales were described by Goa and Watkins (2002) as follows:

1. Knowledge delivery (KD) is based on the conception that learning is a process of acquiring or accumulating knowledge and skills, and teaching is a process of delivering knowledge and skills.
2. Exam preparation (EP) is related to a conception of teaching which puts the emphasis on students' achievement.
3. Ability development (AD) is a teaching conception which aims at the development of students' abilities.
4. Attitude promotion (AP) is based on the conception that learning skills and outcomes relate closely to learning attitudes.
5. Conduct guidance (CG) is a teaching conception which emphasises the implicit nurturing influence on student behaviour of the teacher in modelling good conduct through the learning process.

A five - point Likert scale was used in constructing this instrument (Goa & Watkins, 2002, p.69). Each statement had five possible responses: strongly agree, agree, no opinion, disagree, and strongly disagree.

In addition, the authors categorised these five lower-order level scales into two higher-order level teaching orientations. The first was the moulding orientation (MO); and the second was the cultivating orientation (CO). The authors argued that the higher-order scale of the moulding orientation (MO) was a combination of the KD and EP scales, while the cultivating orientation (CO) was a combination of the AD, AP, and CG scales.

In relation to the lower-order scales, this instrument has shown considerable reliability value, ranging from 0.64 to 0.74, while the higher- order scales, MO and CO, both had alpha coefficients of 0.83. This was considered adequate for research purposes. Furthermore, Goa and Walkins' questionnaires have been widely used. One of the countries in which this questionnaire has been tested was China, which has an exam orientated education system similar to Malaysia. Based on this, reason the researcher considered that the questionnaire was appropriate to be used in this study.

Approaches to Teaching

To measure teachers' approaches to teaching, the present study used a revised version of the Approaches to Teaching Inventory-22 (ATI - 22) an instrument developed by Trigwell, Prosser and Ginns (2005) for the teaching of physical science subjects. The ATI instrument measured two dimensions of teaching approaches. The first dimension was the conceptual change or students-focus approach (CCSF); and the second was the information transmission transfer or teacher-focus approach (ITTF). The revised version of ATI had 25 items after 3 items were removed, due to low standardized factor loading (Trigwell et al., 2005). The ATI instrument used in this study contained both scales, CCSF and ITTF, each of which had 11 items.

The instrument has been broadly used in other subjects besides physical science. For example, it been used to explore the main characteristics in lecturers' approaches to teaching in universities in Japan, Finland and India (Negvi, Tella & Nishimura, 2010); to study university teachers' experience in blended learning environment (Gonzales, 2010); to inquire how approaches to teaching were influenced by discipline and context (Lindblom-Ylanne, Trigwell, Nevgi & Ashwin, 2006); as well as to investigate dissonance in teaching approaches (Prosser et al., 2003).

In this study, ATI was used to investigate the differences in teachers' pedagogical approaches between out-of-field and in-field History teachers in Malaysian secondary schools. Since ATI was developed to explore the relationship between students' approaches to learning and teachers' approaches to teaching (Prosser et al., 2006), it was judged to be an appropriate instrument for use in this study.

History Teaching Methods

This instrument was designed to investigate the pedagogical methods used by the History teachers in the classroom. The researcher developed this instrument consisting of 19 items, based on effective approaches in teaching History. Empirical research by Taylor and Young (2003, p 165) suggested that effective History teaching involved knowing History, doing History and scaffolding the learning of History. Therefore, it was considered appropriate to include these three factors in this instrument, in order to capture the approaches that were being used by the in-field and out-of-field History teachers in this research. Since this instrument was developed would by the researcher, it needed to be validated; any further development would need to be implemented and tested. Validation of this instrument is further discussed in Chapter 4.

Classroom Environment

To investigate students' experience in History classrooms, this study used Fraser's (1990) Individualised Classroom Environment Questionnaire (ICEQ). In addition to measuring students' experience of the actual History classroom, this instrument also measured the learning climate preferred by the students.

The ICEQ questionnaire had two versions, namely the long and the short version, with each having two components. The first component measured the actual classroom environment and the second component measured the students preferred classroom climate. The actual classroom component comprised items on the students' perception of what was really happened in the classroom, while the preferred classroom component measured what students perceived to be the ideal classroom environment.

The short version of ICEQ questionnaire consisted of 25 items for each of the two components. These were related to the five scales of personalisation, participation, independence, investigation and differentiation. These scales were described by Fraser (1990, p.5) as follows:

1. Personalisation – emphasis on opportunities for individual students to interact with the teacher and on concern for the personal welfare and social growth of the individual;
2. Participation – extent to which students are encouraged to participate rather than be passive listeners;
3. Independence – extent to which students are allowed to make decisions and have control over their own learning and behaviour;

4. Investigation – emphasis on the skills and processes of inquiry and their use in problem
solving and investigation;.

5. Differentiation – emphasis on the selective treatment of students on the basis of ability,
learning style, interests, and rate of working.

According to Fraser (1990), ICEQ scales have a number of advantages compared to other classroom environment questionnaires. Firstly, the ICEQ scale can distinguish individualised classrooms from the conventional classroom. Secondly, it can measure both the actual classroom and preferred classroom. Third, this scale can be used for teachers and students. Fourthly, this instrument is easily scored by hand. Finally, the short form component provides the most economical measure of the classroom environment.

In this study, the short version was used because it appeared most appropriate and had good validity and reliability, as it has been widely used and tested in other countries for many years.

Learning Process Questionnaires

This study also attempted to measure the learning approaches of students. The Learning Process Questionnaires (LPQ) developed by Biggs (1987) was adapted and used to measure this construct. There were two scales developed by Biggs, the LPQ and Study Process Questionnaires (SPQ). They are basically similar except for the number of items and some changes in the wordings (Biggs, 1987). The basic difference is that LPQ is designed for secondary school students, while SPQ is designed for tertiary. Both use a five- point Likert scale. Since this study involved secondary school students, the researcher choose the LPQ questionnaire rather than SPQ.

The LPQ questionnaire consists of 36 items, measuring students' Deep Approach (DA), Surface Approach (SA) and Achieving Approaches (AA) to learning. The DA main scale used Deep Motive (DM) and Deep Strategy (DS) as subscales, while SA used Surface Motive and Surface Strategy (SS) and AA used Achieving Motive and Surface Strategy scales. Table 3.1 shows the three different approaches to learning investigated through this questionnaire.

Table 3.1 Motives and Strategies in Approaches to Learning and Studying

Approach	Motive	Strategy
SA: Surface	Surface strategy (SA) is instrumental: main purpose is to meet requirements minimally: a balance between working too hard and failing.	Surface Strategy (SS) is reproductive: limited target to reproduce bare essentials through rote learning
DA: Deep	Deep Motive (DM) is intrinsic: study to actualize interest and competence in particular academic subjects.	Deep Strategy (DS) is meaningful: read widely, interrelate with previous relevant knowledge.
AA: Achieving	Achieving Motive (AM) is based on competition and ego-enhancement: obtaining highest grades, whether or not material is interesting.	Achieving Strategy(AS) is based on organizing one's time and working space: behave as 'model student'

Adapted from Biggs's 1978.

Since the LPQ questionnaire has been used and tested for different age levels in secondary schools, and even tertiary intuitions, this instruments is considered to have good validity and reliability (Biggs, 1987). Moreover, this questionnaire covers areas which could give the researcher a better understanding of students' approaches to learning History. Thus, this instrument was considered most suitable for use in this study.

Students' Perception of History

This scale was designed to measure the students' perception of History learning as the learning outcomes in the History classroom. The researcher developed this instrument based on the History learning objectives from Malaysian History syllabus. This instrument consisted of 10 items, with three subscales; country, community and individual (Ministry of Education, Malaysia, 2002). Since it was specifically based on the learning objectives of the Malaysian History curriculum, it must be recognised that this instrument was rooted in the Malaysian context. However, it was considered an important instrument to determine the students' perceptions towards History learning outcome in the classroom. However, to be used in other Asian contexts and beyond, this instrument would need further development and testing. The validation of this instrument by EFA and CFA are presented in Chapter 6.

This study was conducted in English because this was the language of the questionnaires used and the respondents had been studying English for at least ten years.

3.4 The Approval Process

Ethical Approval

Before the study could proceed, the research proposal had to be vetted and endorsed by senior researchers in the School of Education at the University of Adelaide. Once the proposal was accepted, the next step was to gain ethics approval for the research to be conducted. An application outlining the study was submitted to the University of Adelaide's Research and Ethnics Committee (UAHREC) which approved the application (project number H-173-2009) (refer to Appendix 3).

A similar procedure had to be fulfilled in order to obtain an approval from the Ministry of Education (MOE) in Malaysia to collect data from public secondary schools. This process took a few months because a number of authorities, such as the Education Policy Planning and Research Division (EPRD), the Economy Planning Unit (EPU) and the Department of Education Kuala Lumpur all needed to be approved. MOE and the Department of Education in Kuala Lumpur provided the approval dated 20 March 2010 (refer to Appendix 3). A copy of the research findings was requested by the education authorities in Malaysia, as a part of the clause of approval given.

Pilot Study

A pilot study was set up in two stages to confirm the validity and reliability of the instruments and to test how effectively the two sets of respondents understood and responded to the questionnaires. Pilot tests are generally used “to test the adequacy of the research instruments, namely, pilot the wording and the order of the questions or the range of the answers on the multiple-choice questions” (van Teijlingen & Hundley, 2001, p. 1). In addition, pilot tests also assess the amount of time needed to complete the questionnaires (Creswell, 2008, p. 402). In the first stage, the questionnaires were pilot tested with various university experts in Adelaide and Kuala Lumpur to ensure the face validity of the instruments (Nueman, 1977). They reviewed the content of the questionnaire and confirmed that the items comprehensively covered the domain of the study. Comments from the reviewers were integrated into the revised questionnaires.

The second step was to pilot the questionnaires in the field. According to Oppenheim (1992), this step is essential to ensure that the questionnaire runs efficiently in the actual context, with no important aspects omitted from the questionnaire. For this pilot study, the questionnaires were distributed in one selected school in Kuala Lumpur. The following section gives the details of how the pilot study worked out. For example, in relations to the time needed to complete the questionnaires, it was initially planned that 30 to 35 minutes would be needed for the task. The pilot test, confirmed that the students on average took around 30 minutes to complete the questionnaire as expected.

In the students' questionnaire there were four sections, namely (a) General Information, (b) Classroom Climate, (c) Approaches to Learning, and (d) Students' Perceptions of History. Two of the sections were adapted from the existing instruments, while the other two were developed by the researcher. The first section of the questionnaire gathered demographic information about the respondents' background and the factors that, according to previous studies, could influence students' learning in the classroom.

To test the effectiveness of the questionnaires, the pilot study was conducted at one of the public schools in Kuala Lumpur. The school was chosen because it was co-educational school, had students from different ethnic backgrounds and was conveniently located. The participants involved in this pilot study were 60 students in two Form Four classes randomly chosen by the principal from all the Form Four classes in the school. The pilot study was conducted by a teacher appointed by the principal. The researcher had frequent preliminary contact with the teacher in charge of the pilot study through emails and phone calls to explain the nature of the study.

The completed questionnaires were posted back to the researcher. All the questionnaire responses were checked and processed with the Statistical Package for the Social Sciences (SPSS) (SPSS Inc., 2008) software programme. SPSS version 17.0 was used for analysing the data to determine the reliability and validity of the instruments. The results showed that the questionnaire had sufficiently good reliability and validity to proceed, but minor adjustments were made to the wording and the layout.

A similar pilot study was carried out for the teacher questionnaires. There were four sections in the teachers' questionnaire, namely (a) General Information (b) Teachers' Conceptions of Teaching, (c) Teachers' Approaches to Teaching, and (d) History Teaching Methods. Participants for the pilot study were approached via email and phone by the researcher. After a number of unsuccessful attempts to find teacher respondents for the pilot study through direct email contact with school principals, the researcher was able to gain History teacher respondents from one secondary school in Kuala Lumpur through the personal intervention of senior teachers who knew about this study. Hence, the total numbers of teachers involved in the pilot test were four teachers. Although the totals of the participants were small, the pilot study with teachers achieved its purpose of testing the adequacy of the research instruments and proved useful in refining the questionnaires. On the average the teachers took approximately 20 to 25 minutes to complete the questionnaires, slightly less than the planned 30 minutes. Based on the teachers' feedback, the questionnaires were revised before being used in the actual research study.

3.5 Samples Selection and Data Collection

In this section, the two processes of selecting the samples of respondents and collecting the data are described. Two groups of respondents were required: the first group were the secondary school History teachers and the second were Form Four students studying History. The setting of the research was Kuala Lumpur, Malaysia, where all the schools involved were situated.

Selection of Schools

A total of 18 public secondary schools participated in this study. The researcher began by requesting via email from the MOE, a list of schools from the four districts of Kuala Lumpur. From the list of 94 schools given, the schools were grouped by districts such as, Keramat, Sentul, Bangsar, and Pudu. Due to time and financial constraints the researcher decided to focus on only three of the districts and exclude secondary schools in Bangsar. It was necessary to select the schools that had two categories of teachers. The first was made up of History teachers who were teaching in the field of their specialisation (History), while the second category consisted of History teachers who were teaching the subject even though they had no specialisation in it. The first category was referred to as in-field teachers, while the second was labelled out-of-field. In practice, a few schools had only one of these categories among its History teachers. The sample of schools used in this study was chosen by stratified purposive sampling technique (Ross, 2005), from the three selected regions of Kuala Lumpur. The 18 schools were chosen purposively based on proportion of the in-field and out-of-field History teachers that the school had. The statistics of the schools that participated in this study are shown in Table 3.2.

Table 3. 2 Summary of respondents from participating schools in this study

School Number	Number of History Teachers	Number of Students
1	4	83
2	2	51
3	3	70
4	4	163
5	4	165
6	4	85
7	2	38
8	4	113
9	4	112
10	5	159
11	4	106
12	3	96
13	1	27
14	1	43
15	3	94
16	2	184
17	1	33
18	1	31
Total 18	Total 52	Total 1653

Selection of Teachers

The teachers involved in this study were History teachers from 18 secondary schools in Kuala Lumpur. The process described above resulted in 52 teachers participating; 26 were out-of-field teachers and 26 were in-field History teachers. Of these, 37 were female and 15 were male teachers. All of them taught Form Four students (aged 16+ years). Further discussion on their demographics is provided in Chapter 6.

Selection of Students

All the students involved in this study were from Form Four classes (equivalent to Year 10 in Australia). Since, History is a core subject in Malaysia secondary schools, the samples were easy to obtain. All of the students taught by teachers selected above were included in this study. As a result, 1653 students, 964 females and 689 males participated. Their other demographic information is discussed in Chapter 6.

Data Collection Procedure

The data collection began in March 2009 and ended in July 2009. After obtaining the permission from the MOE and the Department of Education Kuala Lumpur, the researcher arranged a meeting with the principals and History coordinators from all 18 of the Kuala Lumpur secondary schools involved in this study. In this meeting, information about selecting History teachers and students, and the time-table table for data collection were discussed in detail. This was an important stage because of the constraints on the researcher to ensure that the study was completed on time. Next the researcher scheduled visits to the 18 secondary schools that had agreed to participate in this study.

In addition to the teachers' questionnaires, each of the teachers was given a set of student questionnaires to distribute to their students. The numbers of questionnaires distributed depended on how many History classes the teachers taught. Most of the teachers supervised the students' completion of the questionnaire themselves. Only a few teachers allowed the researcher to conduct the questionnaire session within the History class time. On average, each of the students took approximately 30 minutes to complete the questionnaire.

3.6 Some Methodological Considerations in the Analysis

In this section, the researcher discusses some methodological issues which were considered in relation to the suitability of analysis methods and their rationale in this research. Missing values and level of analysis are the specific aspects discussed, as well as the more general notion of causation, as it applied to this study.

Missing Values

According to Brown and Kros (2003), missing and inconsistent data have been a pervasive problem in data analysis since the beginnings of large-scale data collection. This current study involved a large set of data from 52 teachers and 1653 students. Given these numbers, the returned questionnaires forms could definitely be expected to have some missing values. Kline (1998) and Acock (2005) affirmed that the phenomenon of missing data occurred in many areas of research and evaluation, such as survey analysis and experimental designs.

Data inconsistency has many causes; however the three most commonly found relate to the respondents' answers: (a) procedural factors, (b) refusal of response, and (c) inappropriate responses (Brown & Kros, 2003). Additionally, according to Brick and Kalton, (1996 as cited in Ben, 2011), this problem occurs for other reasons related to the research process, which include (a) an element in the target population not being included in the survey's sampling frame (non-coverage), (b) a sampled element not participating in the survey (total non-response), and (c) a responding sampled element failing to provide acceptable responses to a substantial number of survey items (partial non-response). If the issue of missing values is not addressed properly, bias is introduced to an extent that makes it impossible to generalize the results to the overall population.

In addition to understanding the reasons for the missing values, it is essential for the researcher to realize the types of missing values in order to use appropriate strategies to address the problem. Acock (2005) argued that the types of missing values influenced the optimal strategy for working with the problems. Brown and Kros, (2003), as well as Acock (2005, p. 1013) suggested that basically there were 'several types of missing values: (a) missing values by definition of the subpopulation, (b) data missing at random (MAR), (c) data missing completely at random (MCAR), (d) non-ignorable (NI), and (e) outliers treated as missing values'. By understanding the possible types of missing values, a researcher can prevent biases occurring in the findings of a study.

Acock (2005) and Darmawan (2003) have suggested some traditional statistical techniques to address missing data. These approaches include: (a) complete case analysis (listwise deletion), (b) available case methods (pairwise deletion), and (c) filling in the missing value with estimated scores (imputation methods). Each or these methods has its own strength and weakness. According to Allison (2002), there are two advantages in using listwise approaches: (a) it can be used in any of statistical analysis and (b) no special computational methods are required. However, in multivariate settings, such as the present study, when missing values occur on more than one variable, the loss in sample size can be considerable, mainly when the number of variables is large. Darmawan, (2003) added that deleting cases could cause inadequacy as a result of eliminating a large amount of information For this reason, it was considered unwise to apply listwise deletion to the present study.

In relation to the second approach, using pairwise deletion is simple and can increase the sample size, but the disadvantage is that the sample base for each variable changes according to the pattern of missing data (Darmawan, 2003). Darmawan (2003) pointed out that pairwise deletion could be an appropriate method to use when the missing data involved only a small fraction of all cases (5% or less). In the present study the missing values were more than 5 percent, so that pairwise deletion was inadvisable.

The imputation, or filling in missing values method, is defined by Brown and Kros (2003) as 'filling in missing values by attributing them to other available data'. According to Hair et al., (1998), the imputation method is the process of estimating missing data of an observation based on valid values of other variables. Generally, there are several types of 'imputation methods which include: (a) case substitution, (b) mean substitution, (c) hot deck imputation, (d) cold deck imputation, (e) regression imputation, and (f) multiple imputations' (Brown & Kros, 2003 p. 614).

In this study, the imputation method of mean substitution was carried out in addressing missing values in the data sets. The justification for this is explained below. According to Brown and Kros (2003, p 615), mean substitution is 'accomplished by estimating values by using the mean of the recoded or available values'. Although this has been a popular imputation method for replacing missing data, Brown and Kros (2003, p 615) stressed that 'it is important to calculate the mean only from the responses that been proven to be valid and are chosen from the population that has been verified to have normal distribution'. Darmawan (2003) added that this approach might distort the covariance structure, resulting in the estimated variance and covariance being biased towards zero. Nevertheless, the imputation method is still widely used for dealing with missing data. Brown and Kros (2003) indicated that the main advantage of using this method was its ease of implementation and ability to provide all cases with complete information.

Level of analysis

The data files in this study consist of two different levels of information. The first or lower (micro) level is the student level (individual level) and the second or higher (macro) level is the teacher level Students level data comprise the students' learning approaches, classroom climate and students' perceptions toward History learning objectives. Teachers level data include the teachers' conception of teaching, approaches of teaching and teaching methods. ‘Aggregation and disaggregation methods are frequently employed when data are combined from more than one level into single-level analysis’ (Darmawan, 2003, p.71). Such a combination of variables from two different levels into one common level leads to several problems.

According to Snijders and Bosker (1999), the aggregation method involves aggregation of data collected at the lower level (e.g. student), to the higher level (e.g. teacher), while disaggregation method, is disaggregation of higher level data to the lower student level (e.g. assigning teachers’- level data to each student). Darmawan (2003, p. 71) added that these techniques, ‘could lead to an over or under estimation of the magnitude of effects associated with variables that are aggregated of disaggregated and incorrect estimation of error’. Earlier, Snijders and Bosker (1999) had indicated four potential errors in aggregating students data to the teacher level;

(a) *Shift of meaning*. A variable that is aggregated to the macro-level is made to refer to macro units, not directly to micro units.
(b) *Ecological fallacy*. A correlation between macro level variables cannot be used to make assertions about micro level relations (Hox, 2002; Snijders & Bosker, 1999).
(c) *Neglect of original structure*. In the examination of the effects of sampling error, inappropriate tests of significance are applied.
(d) *Loss of cross-level interaction.* These approaches prevent the examination of potential cross level interaction effects between a specified micro level variable and an as yet unspecified macro level variable.

Disaggregation of data had comparable disadvantages the other way. Disaggregation bias referred to the distorting effects of the disaggregation of group level data (organisational) to the individual level. Hox (2002 p. 3) added that ‘using larger number of disaggregation cases for the sample size will lead to significant tests that reject the null-hypothesis far more often than the nominal alpha level suggest’.

All of these potential disadvantages were taken into consideration in the data analysis for this study. Nevertheless, in the end, the single level PLSPATH analysis technique was used in this study, despite the fact that this technique limited the information on variables collected, at the individual and organisational level. Structural equation modeling (SEM) using AMOS was also applied in this study. Besides that, HLM was carried out In order to accommodate the nested data in social science research and to minimise the problems of single-level analysis and prevent the drawing of a wrong conclusion. Thus HLM modelling was considered capable of dealing with the hierarchical nature of the data used in this current study.

Notion of Causality

Given the correlational data collected, the analysis needed to make use of what is called causal inference. The notion of causality applies whenever the occurrence of one event provides reason enough to expect the production of other.

Heise (1975, p.12) gave a more precise statement to guide and restrict the application of the causality principle in theory construction and the research design.

> An event C, causes another event, E, if and only if
>
> (a) An operator exists which generates E, which responds to C, and which is organized so that the connection between C and E is can be analysed in sequence of compatible components with overlapping event fields;

(b) Occurrence of event C is coordinated with the presence of such an operator – such an operator exists within the field of C;

(c) When conditions (a) and (b) are met, when the operator is isolated from the fields of events other than C, and neither C nor E is present to begin with, the occurrence of C invariably starts before the beginning of an occurrence of E.

(d) When condition (a) and (b) are met, C implies E; that is, during some time interval occurrences of C are always accompanies by occurrence of E, though E may be present without C or both events may be absent.

Condition (a) sets out the highly structured circumstances which must be present before the particular causal relation has any possibility of occurring. Condition (b) indicates that the trigger event must be coordinated with these circumstances before the consequent event can occur. Temporal directionally, in the sense that trigger event must always precede the occurrence of the consequents event is defined in condition (c). Condition (d) states the requirement for being able to logically imply that one event causes or effects the occurrence of another.

Another definition of cause and effects is given by Kenny (1979, pp.2-3).

> A causal statement, to no one's surprise, has two components: a cause and effect. Three commonly accepted conditions must hold for a scientist to claim that X caused Y: (1) Time precedence, (2) Relationship, and (3) Nonspuriousness

Vogt (1993, p. 31) defined it in a similar way:

> To attribute cause, for X to cause Y, three conditions are necessary (but not sufficient): (1) X must precede Y; (2) X and Y must covary; (3) no rival explanations account for the covariance between X and Y.

It is usually easy to satisfy the first condition in longitudinal studies, where data are gathered, over a specified period of time. However, constraints of time and money, especially in overseas field research, such as this study, inhibit such designs. Instead, the researcher can choose, a cross sectional study which includes a retrospective measure of respondents' attitudes and perceptions before the research commenced.

In relation to the second condition, an examination of correlation coefficients could indicate whether or not variation in the presumed cause is associated with variation of the effects.

With respect to the last condition, Tuijnman and Keeves (1994, pp. 4340-4341) stressed the importance of to specifying the model being investigated as precisely as possible.

> The function and purpose of the causal models which are used in path analysis and structural equation modeling are to specify as fully as possible the interrelations between variables so that appropriate statistical control might be employed.

Since causal inference begins with the assumption that a preceding event might cause a succeeding event, a helpful approach is to eliminate any relationships that appear to be impossible or implausible in given circumstances. This elimination approach relies on the premise that the physical and social world is pervaded by deterministic relations which human beings are not necessarily aware of. However, relationships in both the physical and social world most are most likely to be probabilistic in nature rather than deterministic. If models are constructed on the basis that the relations which are known to exist are deterministic, the model could have serious deficiencies since more important probabilistic relations could be ignored, to the extent that the research gives rise to spurious conclusions. Rather reliable models can be developed by eliminating the relations which prove to be not statically significant when they are assessed in probabilistic terms.

3.7 Statistical Analysis Techniques

This section describes the statistical analysis techniques employed in this research. The aim was to examine causation in the History classroom and to analyse teachers and student factors that might have an effects on the teaching and learning of History. It was important to employ appropriate statistical procedures in order to obtain valid results.

Confirmatory Factor Analysis (CFA)

There were two types of factor analyses used: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA was used when the relationships between the observed variable and their underlying factors were unknown or uncertain. On the other hand, CFA is used when the researcher had some knowledge of the underlying latent variable structure (Byrne, 2010).

Suhr (2006) explained that CFA is a statistical technique used to verify the factor structure of a set of observed variables. It allows the researcher to test the hypothesis of whether a relationship exists between observed variables and their underlying latent construct. Lahey, McNealy, Knodt, Sporns, Manuck, Flory, Applegate, Rathouz, and Hariri (2012, p. 1982) supported Suhr (2006) by pointing out that CFA can allow 'statistical test for measurement model (hypotheses regarding loading of multiple manifest indicators on underlying latent constructs) because CFA models allow for measurement error in the manifest variables, inferences about the latent constructs can be interpreted as if the latent constructs were measured without error'.

In this study, Analysis of Moment Structure (AMOS) was used to draw the PLSPATH model and to conduct confirmatory factor analysis. According to Arbucke and Worthke (1999), AMOS provides the following methods for estimating structural equation models:

(a) Maximum likelihood,

(b) Unweighted least square,

(c) Generalised least square,

(d) Browne's asymptotically distribution free criterion, and

(e) Scale free least squares.

(Darmawan, 2003, p. 82)

Darmawan (2003, p. 83) added that AMOS 'performs a full information maximum likelihood imputation instead of relying on the mean imputation, listwise deletion or pairwise deletion,' in order to confront the missing data.

This study focused on the latent variables that represented the teacher and student factors that were developed as the ground theoretical concepts for the teaching and learning of History in the classroom. CFA was therefore used in this research to test the factor structures of the latent variables under examination. These were teacher conceptions, teacher History methods, teacher approaches, students' classroom climate (actual and preferred) and students' learning approaches and History learning outcomes. Ben (2011, p. 83), suggested that CFA was used "to examine the fit (or consistency) of data to the measurement model of each scale". This statistical procedure was accomplished by using SEM (Structural Equation Modeling), with AMOS.

Structural Equation Modeling (SEM)

SEM technique is commonly employed in the multivariate analysis of structural relationships involved in the phenomena under investigation. Byrne (2010, p. 3) further added that, 'the term structural equation modelling conveys two important aspects of the procedure: (a) that the causal processes under study are represented by a series of structural (i.e., regression) equations, and (b) that these structural relations can be modelled pictorially to enable a clearer conceptualization of the theory under study'.

SEM has many advantages compared to the other conventional statistical techniques. Firstly, SEM is a confirmatory rather than an exploratory approach. In second place, SEM permits estimation of measurement errors. Thirdly, SEM enables the examination of observed and unobserved or latent variables, which is not possible in traditional methods (Byrne, 2010).

According to Bollen and Long (1993) there are five steps in the application of SEM: (a) model specification; (b) identification; (c) estimation; (d) testing; and (e) re-specification.

(a) Model specification involves formulating the initial theoretical model. This model should be hypothesized on the basis of a literature review. In this study the theoretical model was based on the 3P Model of Learning of Biggs. (1987) Theoretical models can be stated in terms of equations or in graphical forms.

(b) Identification refers to inquiring whether a single value can be found as the basis for estimating the parameters in the theoretical model. All the observed variables are constrained to load on just one latent variable.

(c) Estimation requires the knowledge of the various estimation techniques that are used depending on the scale and/or distributional property of the variable(s) used in the model. Several estimations are currently available, such as maximum likelihood (ML), generalized least squares (GLS), and unweighted or ordinary least squares (ULS or OLS).

(d) Testing of fit involves interpreting model fit or comparing fit indices for alternative or nested models, as well as the consistency of the model with the data. A number of goodness-of-fit criteria (GOF) have been proposed and studied in the literature

(f) Re-specification usually occurs when the model fit indices suggest a poor fit. In this instance, the researcher makes a decision regarding how to delete, add, or modify paths in the model, and subsequently reruns the analysis.

Partial Least Square Path Analysis (PLSPATH)

Partial Least Square is the structural equation modeling (SEM) technique that is used to examine a structural or causal model with observed (manifest) variables. It was developed by Sellin (1989) and based on the Partial Least Square (PLS) procedure introduced by Wold (1985). This technique is used to estimate the path coefficients in path models involving latent variables indirectly observed through multiple indictors. The PLS procedure is related conceptually to principal component analysis and regression analysis. This process is suitable for study with a small number of data sets and models (Sellin & Keeves, 1997).

The Partial Least Square PATH model consists of 'two sets of linear equations, called the inner model and the outer model. The inner model specifies the hypothesized relationships among the latent variables (LVs), and the outer model specifies the relationship between LVs and observed or manifest variables (MVs)' (Sellin & Keeves, 1997, p. 2). There are two categories of variables in the path diagrams: the independent variables that do not depend on any other variables are referred as 'exogenous variables'; and the variables that are dependent on other variables are referred as ‘endogenous variables’. (Rintaningrum, Wilkinson & Keeves, 2009, p. 47; Loehlin, 1998, p. 4).

Rintaningrum, Wilkinson and Keeves (2009 p. 46) further added that the indirectly observed latent variables or constructs (LVs) are illustrated as circles and the directly observed manifest variables (MVs) are drawn as rectangles in the path diagrams.

Land (1969, p.6) explained that PLS diagrams need to be drawn using the following conventions:

1. The postulated causal relations among the variables of the system are represented by unidirectional arrows, extending from each determined variable to each variable dependent on it.
2. The postulated noncausal correlations between the exogenous variables of the system are symbolized by two-headed curvilinear arrows to distinguish them from causal arrows.
3. Residual variables are also represented by unidirectional arrows leading from the residual variables to the dependent variable.
4. The numbers entered beside the arrow on a path diagram are the symbolic or numerical values of the path and correlation coefficient of the postulated causal and correlation relationships.

Loehlin (1998, p. 2) maintained that the diagram is ‘an easy and convenient representation of the relationships among a number of variables’. Land (1969, p. 3) also suggested that the path diagrams were developed to ‘provide a convenient representation of the systems of relation’.

PLSPATH analysis has many advantages as a statistical technique Sellin and Keeves, (1997, p. 1) emphasised that one of the advantages was that, ‘no assumptions need to be made about the shape and nature or the underlying distributions of the observed and the latent variable’. Loehlin (1992 p. 2), stressed that the Path diagrams had an ability to indicate the ‘relative strength of a correlation or causal influence’.

For these reasons, PLSPATH was used to investigate the latent variables (LVs) and manifest variables (MVs) in this study, as well as to identify the relationship between the latent variables (LVs) and the manifest (MVs).

Hierarchical Linear Modeling (HLM)

In educational research the data often fall into clusters. Students are nested within the classes, teachers are clustered within in the schools and schools are clustered within a district. These data are examples of hierarchical or nested data. Hence, HLM statistical technique is appropriate in analysing such multilevel data because HLM allows the researcher (a) to improve the estimation of individual effects; and (b) to model cross level effects; (c) to partition variance-covariance components across levels of analysis in order to apply significance tests more appropriately (Bryk & Raudenbush, 1992).

Darmawan, (2003, p. 86) suggests that the aim of using HLM is to:

> overcome the problems associated with single-level procedures such as partial least squares or structural equation modeling where data have to aggregated or disaggregated before they can be analysed. In the aggregation process information is lost because the variance of lower level variables, which often represent a considerable amount of the overall variance, is reduced. The disaggregation process also leads to violation of the assumption of the independence of observations because the same value is assigned to all members in one group.

One of the advantages of using HLM over the conventional statistics technique is that HLM can be employed to 'examine relationships involving predictors at two or more levels and an outcome at a single level, generally at the lowest level represented by the predictors' (Gavin & Hofmann, 2002, p. 16). They further added that HLM allowed assessing: (a) the influence of predictor at both the individual and group level on an individual-level outcome, and (b) the moderating effects of group level variables on relationships between individual-level variables (Gavin & Hofmann (2002, p. 16). Additionally, Bryk and Raudenbush, (1992), claimed that HLM conveyed two other types of data hierarchies: repeated –measures data and meta-analytic data.

According to Osborne (2000, p. 3) the basic concepts of HLM were similar to OLM (Ordinary Least Square) regression. He explained that what is reffered to have as level, the student or base level,

> base level (usually the student level, referred to here as level 1), the analysis is similar to that of OLS regression: an outcome variable is predicted as a function of a linear combination of one or more level 1 variables, plus an intercept, as so:
>
> $$Y_{ij} = \beta_{0j} + \beta_{1j}X_1 + \ldots + \beta_{kj}X_k + r_{ij}$$
>
> where β_{0j} represents the intercept of group j, b $_{1j}$ represents the slope of variable X_1 of group j, and r_{ij} represents the residual for individual i within group j. On subsequent levels, the level 1 slope(s) and intercept become dependent variables being predicted from level 2 variables:
>
> $$\beta_{0j} = \gamma_{00} + \gamma_{01}W_1 + \ldots + \gamma_{0k}W_k + u_{0j}$$
> $$\beta_{1j} = \gamma_{10} + \gamma_{11}W_1 + \ldots + \gamma_{1k}W_k + u_{1j}$$

> and so forth, where γ_{00} and γ_{10} are intercepts, and γ_{01} and γ_{11} represent slopes predicting β_{0j} and β_{1j} respectively from variable W_1. Through this process, we accurately model the effects of level 1 variables on the outcome, and the effects of level 2 variables on the outcome.
>
> (Osborne,2000, p.3)

Darmawan (2003) explained that although HLM has many advantages in overcoming the problems associated with single-level procedures, its limitation is that it does not allow the construction of latent variables and does not permit the modeling of indirect effects between variables.

Since this present study involved (nested) multilevel data at student and teacher level, HLM was used to investigate the effects of students and teachers' characteristics on students' outcomes. HLM procedure allowed the analysis of the variables at both levels (teacher and student) simultaneously, while being able to show the effect between two variables at the two levels (Raudenbush & Bryk, 1997).

3.8 Validity and Reliability of Instruments

Validity and reliability are important concepts in social science research process. According to Netemeyer et. al (2003), validity and reliability are part of measurement properties in a research process. Kvale (1995) pointed out that in general validity related to confirming whether the research method being used really examines what is set out to investigate In relation to this, a variety of definitions of validity has been developed. The traditional definition by Cronbach (1949), as cited in Sikinson & Jones (2001), stated that 'validity is a "test" measure'. In order to fit in to the current progress of validity concept, the definition has changed. For example, Messick (1989, p 13), as cited in Sinkinson & Jones (2001, p. 224), defines validity as 'integrated evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment'. Sireci's (2007) definition also stresses that a combination of theory and evidence is required in a validation evolution.

Although the concept of validity has been questionable and complex, in general, validity means, 'the degree to which evidence and theory support the interpretations of test scores entailed by proposed user of the test' (Standard, AERA et al., 1999, as cited in Sireci, 2007, p. 478).

There are several types of validity, such as face or content validity, construct validity, and criterion-related validity. Face or content validity can be achieved by ensuring that the content of the test fairly samples the class or the fields of the situation or subject matter in the question (Cohen 1992). In contrast, content validity is more focused on the coverage in particular field and representativeness rather than the score or measurement. In this study to check the content validity, the instruments were given to experts in the field; they were evaluated and judged by the teachers and lectures who had expertise in this field. The reviewers were encouraged to give comments on the instruments, all of which were carefully integrated into the revised instruments. Following this, a pilot study was carried out with sixty students (two classes) and four teachers from secondary schools in Kuala Lumpur, using the revised instruments. The participants were encouraged to give comments on these questionnaires.

Criterion-related validity is achieved by comparing the scores on the test with one more variables (criteria) from other measures or tests that are considered to measure the same factor (Cohen, 1992). An investigation of this validity can be implemented in two ways, through concurrent or predictive validity. Concurrent validity occurs when the criterion obtained at the same time as the test score. On the other hand, predictive validity occurs when the criterion is obtained at some time after the test score. Nevertheless, Darmawan (2003) claimed that one of the main complexities in criterion-related validity is finding a suitable criterion. As a result, construct validity was used in this study.

Neuman (2006), defined construct validity as the extent to which the results obtained from the use of the measure fit the theories. Darmawan (2003, p. 89) affirmed this definition, in pointing out that 'construct validity testifies to how well the results obtained from the use of measure fit the theories around which the study is designed'. Therefore, in this study exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) techniques were carried out to obtain construct validity.

Reliability refers to accuracy in the consistency and stability of instruments (Sikinson & Jones, 2001; Thompson, 2004). Reliability is also concerned with the degree to which a set of two or more indicators measures the same construct and is free from errors (Hair et al., 1998). Thordnike (1988, p 138) added that reliability 'relates to the question of how accurately the test sample represents the broader universe of responses from which it is drawn'. Reliability is the condition for validity (Knight, 1997) or as Moss (1994, p.6) put it 'Without reliability, there is no validity'. According to Pallant (2001), test-retest and internal consistency are indicators commonly used to measure reliability. Besides that, Cronbach alpha coefficients caculation is also commonly used as an indicator of scale reliability (Alagumalai & Curtis, 2005). Therefore, in this study, the internal consistency reliability of the measures was assessed through Cronbach alpha coefficients.

3.9 Summary

This chapter has explained and provided justification for the research methods used in this study. In adopting a quantitative approach to this investigation, the researcher developed two set of questionnaires to gather data related to the teacher and student variables in the theoretical framework based on Biggs' 3P model of student learning. Each set of questionnaires was made up of two instruments adapted from previous studies and one developed by the researcher especially for this investigation of History teaching and learning.

The teachers' questionnaire was made up of (a) Teachers Conceptions of Teaching by Gao & Watkins (2002); (b) Approaches to Teaching Instruments (ATI) by Trigwell, Prosser & Ginns (2005); and (c) the researchers' History Teaching Method. The instruments used in students' questionnaires were (a) Individualised Classroom Environment Questionnaire (ICEQ) by Fraser (1990); (b) Biggs's Learning Process Questionnaire (LPQ) by Biggs (1987); and (c) the researcher developed instruments on Students' Perceptions of History. Both sets of questionnaires were validated and trialled in the pilot test, with appropriate adjustments made to the final instruments.

The data collection was carried out after the researcher was granted ethical clearance from the University of Adelaide and permission to conduct the research by the Ministry of Education, Malaysia. The stratified purposive sampling method was applied to select 52 teachers as participants and 1653 Form Four students from various secondary schools in Kuala Lumpur, Malaysia. The collection of data was arranged through the school principals and History teachers concerned.

Confirmatory Factor Analysis (CFA), Path Analysis, Structural Equation Model (SEM), and Hierarchical Linear Modeling were statistic techniques chosen as most appropriate to deal with the issues of missing values, the different levels of data and the researchers' commitment to the principle of causality. The following chapter reports the validation procedures used prior to the data analyse.

Chapter 4 Validation of the Research Instruments: Teachers'

4.1 Introduction

This chapter briefly describes the teachers' instrument and the items. In addition, it also explains how Structural Equation Modeling (SEM), using CFA, was used to validate the instrument, on the basis of the 52 teachers in the data set. The teachers' questionnaire comprised four sections. Section 1 was used to gather respondents' personal information, particularly concerning academic qualifications. Section 2 of the questionnaire investigated teachers' conceptions of teaching (TCONT). Section 3 focussed on teachers' approaches to teaching (ATI). In section 4, of the questionnaire teachers' History teaching methods (HTEAM) were investigated.

4.2 The School Physics Teachers' Conceptions of Teaching (TCONT) Instrument

The School Physics Teachers' Conceptions of Teaching (SPTCT) was a questionnaire of 37 items developed by Gao and Watkins (2002). In the present study it is labelled as the Teacher's Conceptions of Teaching (TCONT) instrument. Each item reflects teachers' opinions or ideas about teaching and learning and uses a five-point Likert-typescale response which include: (1) Strongly Disagree, (2) Disagree, (3) No Opinion, (4) Agree, and (5) Strongly Agree. TCONT incorporates 5 separate scales, namely knowledge delivery (KnowDeli), exam preparation (ExamPrep), ability development (AbilityDev), attitude promotion (AttitudePro) and conduct guidance (ConDance). Table 4.1 presents the 37 items which are grouped in five lower-order and two higher-order scales.

Table 4. 1 TCONT instrument subscales

Subscale		Items	Re-worded Items
KnowDeli (Knowledge Delivery)	1.	Students learning means accepting knowledge from the teachers	
	5.	I like those students who know the knowledge learnt accurately and in detail	I like those students who know the knowledge learnt accurately
	9.	You would be very satisfied if my students could remember the details knowledge imparted in the Physics textbooks	I would be very satisfied if my students could remember the details knowledge imparted in the History textbooks
	12.	Delivering knowledge is the essence of teaching	
	15.	You expect my students to become more and more interested in learning through my Physics subject	I expect my students to become more and more interested in learning through my History subject
	17.	I strongly agree with the simile that views a teacher as a bank of knowledge	
	21.	Proficiency in History is of prime importance to a Physics teacher	Proficiency in History is of prime importance to a History teacher
	24.	Knowing the teaching content thoroughly is the most important task in preparing the lesson.	
ExamPrep (Exam Preparation)	4.	Usually I will publish the results of student performance in tests	
	8.	You should spend most of my time in drilling students with exam-type items	I should spend most of my time in drilling students with exam-type items.
	11.	I like to exchange information and share experience colleague in meetings and in-service activities	
	13.	Students go to school is to gain qualification necessary for future studies or career.	The most important reason for students going to school is to gain qualification necessary for future studies or career
	14.	Preparing a large amount of teaching materials is the most important factor for successful classroom teaching.	
	16.	I prefer those students who are competitive and get good marks in exams.	
	20.	My greatest concern is that my students will get excellent marks in exams.	
	27.	Drilling students with well-designed exercises is key to a successful lesson.	
	34.	Teachers should know clearly about the objectives of their schools and the examination.	
	37.	I concentrate on how to ensure that students follow my teaching while preparing my lessons.	
AbilityDev (Ability Development)	18.	Organizing activities to change students' misconceptions is the key of good teaching.	
	22.	I often challenge students with questions focusing on their perceptions before I start a new topic.	
	23.	For a successful lesson, it is very important to make the students concentrate on their learning.	
	28.	The theme of my preparation for a lesson is how to organize student activities.	
	29.	To be able to promote correct learning attitudes in students is a very important prerequisite for a teacher.	
	30.	A teacher should win the students' respect through his/her attitude to studying.	
	32.	The role of a Physics teacher is similar to a tourist guide who leads students in the way of learning.	The role of a History teacher is similar to a tourist guide who leads students in the way of learning.

Table 4.1 TCONT instrument subscales (continued)

Subscale		Items	Re-worded Items
AttitudePro **(Attitude Promotion)**	2.	Most of the teacher training workshops which I attended focus on strategies of promoting students' motivation.	
	6.	Interaction with the outside world is the most important way of students learning.	
	19.	Teaching means to develop students' behaviour.	
	25.	A Physics teacher should understand the fundamentals of students' attitudes.	A History teacher should understand the fundamentals of students' attitudes.
	31.	Teachers would be better not organizing classroom activities so they can spend most the time for a better interpretation of knowledge.	I would be better not organizing classroom activities so they can spend most the time for a better interpretation of knowledge.
	35.	I try hard to create chances for students to ask questions during class.	
	36.	I never miss any chances to encourage my students to learn actively.	
ConDance **(Conduct Guidance)**	3.	I never miss any chance to demonstrate how to be a nice person.	
	7.	I am very interested in sharing experiences with my colleagues on improving student behaviour through teaching.	
	10.	Student learning means knowing how to mature gradually.	
	26.	A teacher should act as a model of learning to students by being diligent in learning and teaching.	
	33.	I pay much of my attention on how to educate students with good conduct when preparing a lesson.	

The five lower-order scales are (a) Knowledge Delivery (KnowDeli) 8 items, (b) Exam Preparation (ExamPrep) 10 items, (c) Ability Development (AbilityDev) 7 items, (d) Attitude Promotion (AttitudePro) 7 items, and (e) Conduct Guidance (ConDance) 5 items.

The Higher-order scale of Moulding Orientation (MO) is a combination of the KnowDeli and ExamPrep scales. The second higher-order scale of Cultivating Orientation (CO) is a combination of AbilityDev, AttitudePro, and ConDance.

In this study of History teaching in Malaysia the factor name given to this questionnaire is TCONT (Teachers' Conception of Teaching), which consists of 37 items: TCONT1 – TCONT37 as presented in Table 4.1. Nine items from the original questionnaires for Physics teachers, 5,8,9,13,15,21,25,31, and 32, were re-worded in the TCONT instrument.

In this study, Cronbach Alpha is used to examine the internal consistency of the subscales. Cronbach Alpha values for the five subscales of the Goa and Watkins' questionnaire were as follows: KnowDeli (0.74), ExamPrep (0.74), AbilityDev (0.65), AttitudePro (0.73), and Condance (0.64). For the higher-order scales, Moulding Orientation (MO) and Cultivating Orientation (CO), the Alpha coefficients were both 0.83. According to Nunnaly (1978), a value of 0.7 and above is considered as acceptable.

4.3 Instrument Structure Analysis

This section examines the construct validity of the TCONT instrument. The analysis was based on the 52 teachers from 18 secondary schools in Kuala Lumpur, who were the respondents of this research. AMOS version 17 was used to carry out the Confirmatory Factor Analysis (CFA) of the original models (base line models) from the authors. Subsequently a number of alternative models were also examined.

Confirmatory Factor Analysis (CFA)

According to Curtis (2005), it is possible to use CFA to hypothesise the structures and to test those structures against the observed data. Byrne (2010, p. 3) also suggested that basically 'CFA was a statistical methodology that takes a confirmatory (i.e., hypothesis testing) approach to the analysis of structural theory bearing on some phenomenon'. In other words, the proposed structure is either rejected because it is not fitting or accepted based on the adequate degree of fit which is found in the structure. In addition, a number of alternative models can also be explored to find out the best fitting model, the one that is most consistent with the data. CFA can be used to display and discuss the results of alternative models based on the factor loadings and the values of model fit indices. Nallaya (2010) defined the factor loadings as the correlation between the observed variables (items) and the latent variables.

Five alternative models were tested in this study as suggested by Curtis, (2005). The five factor models were: (a) Single Factor Model in which all the observed variables are generated to reflect a single factor, (b) Five orthogonal Factor Model, (c) Five correlated Factor Model (d) Hierarchical Model in which several distinct factors are shown to reflect a higher order of factors, and (e) Nested Model in which variables reflect both a set of discrete or uncorrelated factors, but also reflect a single common model. The best fitting factor model result based on the model fit indices, is reported.

Model Fit Indices

The results from the CFA analysis show various fit indices, such as Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Adjusted Goodness-of-fit Index (AGFI), Parsimony Goodness-of-fit Index (PGFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI). According to Ben (2010, p 100), these indices 'assess how well the sample covariances were reproduced by the covariance predicted from the parameter estimates'. A value of RMSEA shows how well the model, 'with unknown but optimally chosen parameter values', would fit the population covariance matrix if it were available' (Diamantoplous & Siguaw, 2000, p.85). According to Darmawan (2003, p.96), 'values of RMSEA less than 0.05 can be considered indicating a good fit, and values between 0.05 and 0.08 are indicating reasonable fits and values between 0.08 and 0.10 a mediocre fit and values over 0.10 a poor fit'. Another index used is the GFI which indicates the relative degree of variance and covariance jointly explained by the model (Pang, 1996, p.74). PGFI makes a different type of adjustment to take into account the complexity of the model. According to Diamantoplous and Siguaw, (2000), GFI is commonly suggested as the most reliable measure of absolute fit in most circumstances. AGFI is interpreted as the GFI value, adjusted for degrees of freedom. Values at or greater than 0.90 are accepted as a good model fit for GFI and AFGI.

The CFI, TLI and RMSEA values are preferred by many researchers for a one time analysis (Schreiber, et al. 2006). Besides the numerous goodness of fit indicators mentioned above, chi-square divided by the number of degrees of freedom is also one of the indicators of goodness-of-fit used in this study. A summary of the fit indices used in this study is presented in Table 4.2.

Table 4. 2 Summary of fit indices used in validation of the scales in teachers' instrument

Fit Index	**Values to indicate Good Fit**
Root Mean Square Error of Approximation (RMSEA)	≤0.05
Goodness-of-fit Index (GFI)	≥0.90
Adjusted Goodness-of-fit Index (AGFI)	≥0.90
Parsimony Goodness-of-fit Index (PGFI)	≥0.90
Comparative fit index (CFI)	≥ 0.90
Tucker-Lewis Index (TLI)	≥ 0.90
$\frac{x^2}{df}$	< 5

Confirmatory Factor Analysis of Goa and Watkins's Model

CFA was used to confirm whether the observed variables measuring the latent variables that they were supposed to measure in the instrument. This section reports the fit of Gao and Watkins' models. According to Goa (2002), there were two ways of validating the models: (a) Five Separate Models tested individually which included models for KnowDeli

(KD), ExamPrep (EP), AttPro (AP), AbilityDev (AD), and ConDance (CG), and (b) Five Factor Models tested simultaneously which included a Five Orthogonal Factor and a Hierarchical Factor Models. These models are presented in Figures 4.1 and4.2, followed by the model fit indices for the comparison to examine which model best fits the sample data in Table 4.3.

Factor loadings for five separate One-Factor Models: (a) KnowDeli, (b) ExamPrep, (c) AttPro, (d) AbilityDev, and (e) ConDance and Five Factor Models: Five - Orthogonal Factor Model and Hierarchical Model are presented in Table 5.3. The factor loadings for the One-Factor Model and the Five-Factor Model were similar. Hair, Black, Babin, and Anderson, (2010, p.117) suggest that 'factor loadings in the range of $\pm$ 0.30 to $\pm$0.40 are considered to meet the minimal level; of interpretation of the structure. Loading $\pm$ 0.50 or greater are considered practically significant. Loadings exceeding 0.70 are considered indicative of well-defined structure and are the goal of any factor analysis'.

Based on these criteria of significance, the results showed (see Table 4.3) that almost all factor loadings in TCONT variables were significant. However, four variables had loadings less than the minimal level of significance of $\pm$ 0.30. They were TCONT1 (0.08), TCONT4 (0.20), TCONT2 (0.28), and TCONT31 (-0.16). These poor loadings indicated that the variables were not adequate for factor solution (Hair et al., 2010). In other words, these variables had low commonality with the latent variables. Consequently, TCONT1 (0.08) and TCONT31 (-0.16) were excluded in the alternative models.

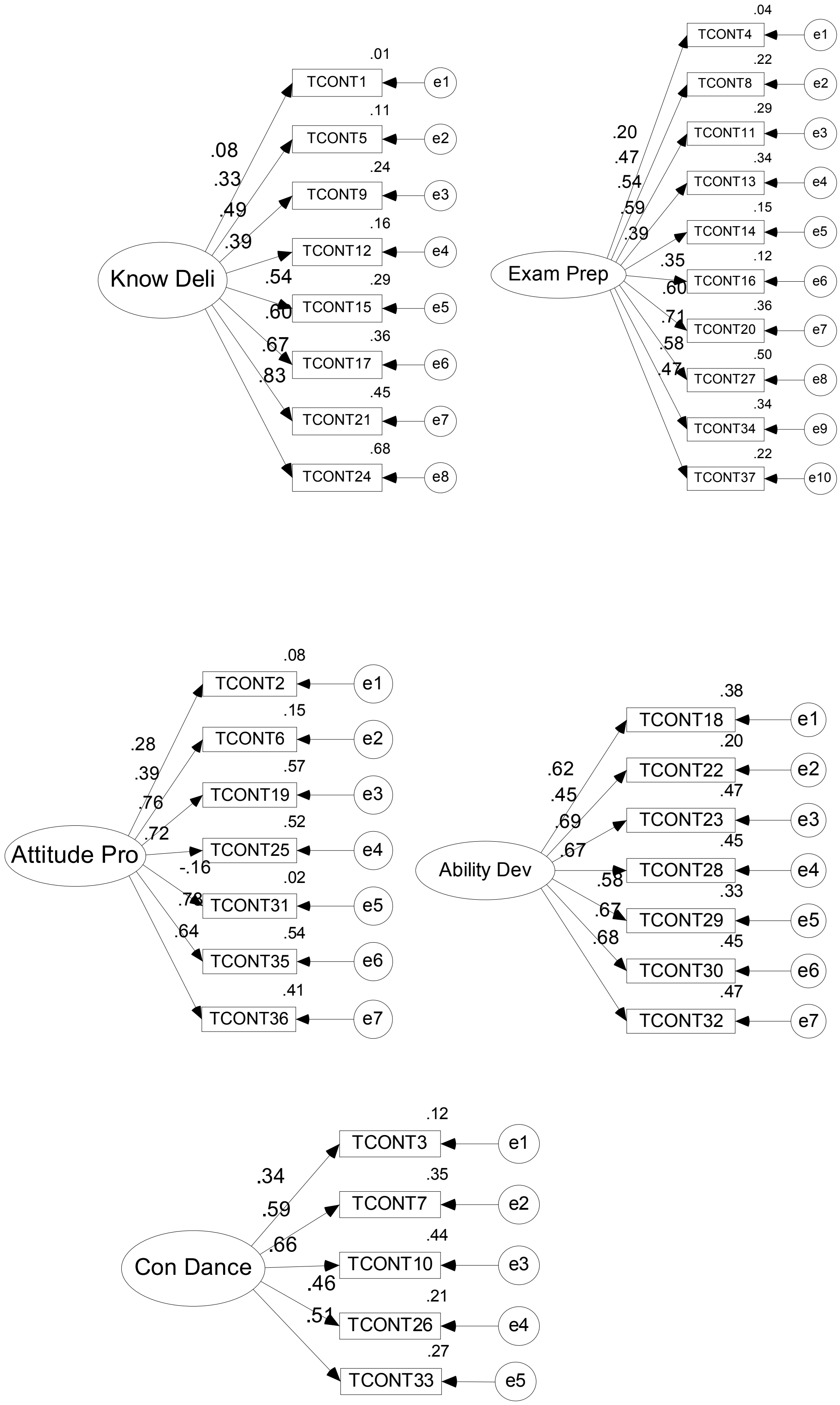

Figure 2. 3 Five Separate Models: One-Factor Model of (A) KnowDeli, (B) ExamPrep, (C) AttitudePro, (D) AbilityDev, and (D) ConDance Factor Models

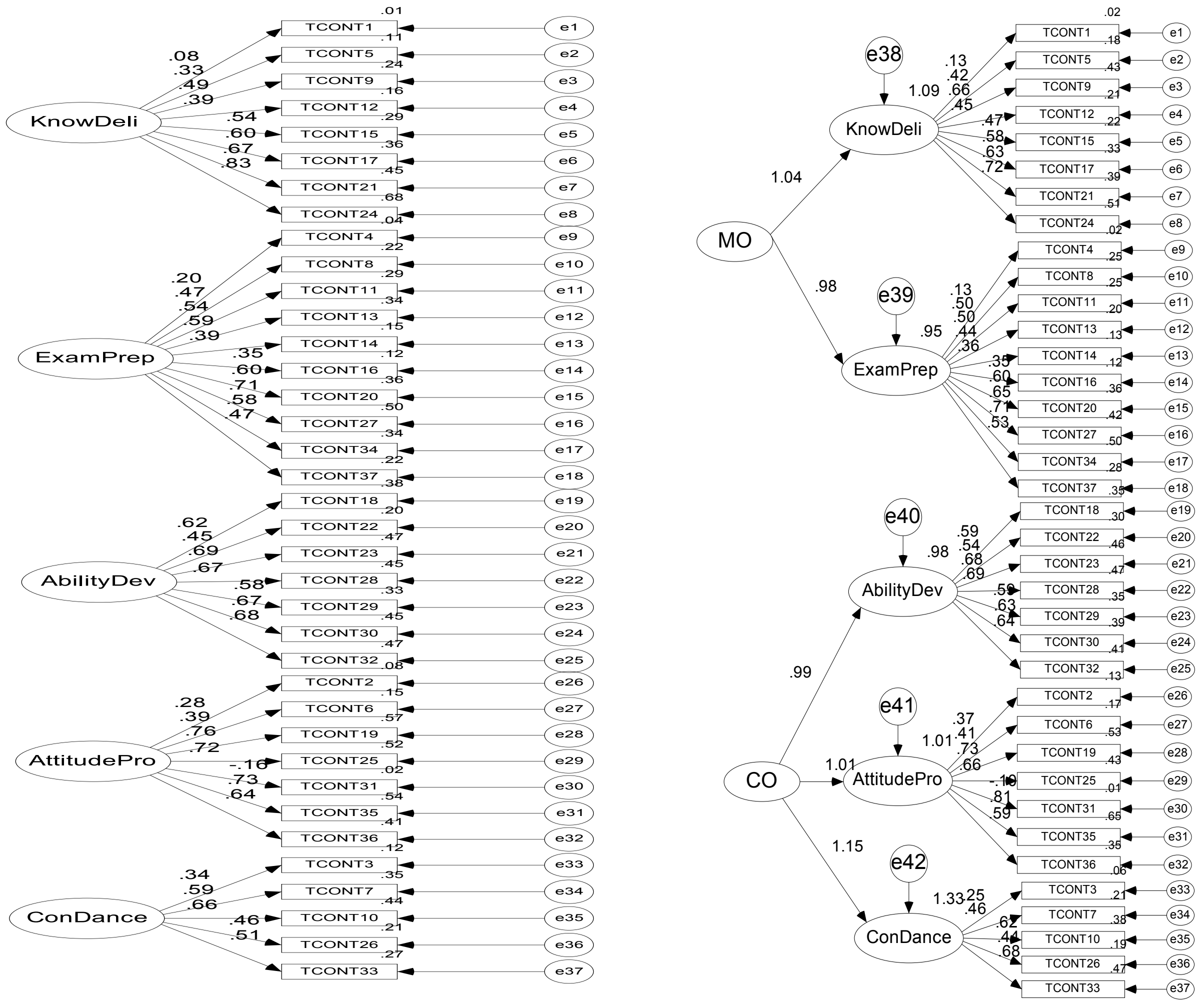

Figure 4. 1 Five Factor Models: Five Orthogonal Factor Model and Five Hierarchical Model

Factor Loadings for the Hierarchical Model showed similar results, all items met the minimal significance level of loadings (± 0.30) except for items TCONT1 (0.13), TCONT4 (0.13), TCONT3 (0.25), and TCONT31 (-0.10). The results shown in Figure 4.2 indicated that the two higher-order factors of Moulding Orientation (MO) and Cultivating Orientation (CO) were strongly reflected by their respective first-order factors. However, the factor loadings of KnowDeli (1.04) for the MO as well as AtitudePro (1.01) and ConDance (1.15) for the CO were above 1. Therefore, further analyses were carried out using the alternative models which are presented in the subsequent section.

Table 4. 3 Factor loadings of items of Five Separate Models: A, B, C, D, E, and Five Factor Models: Five Orthogonal Factor Model and Five Hierarchical Model.

Five Separate Models			Five Factor Models			
Variables	Subscale	One-Factor Model	Five-Orthogonal Factor Model	Scale	Subscale	Five Hierarchical Model
TCONT1	**(A)** KnowDeli	**0.08**	**0.08**		KnowDeli	0.13
TCONT5		0.33	0.33			0.42
TCONT9		0.49	0.49			0.66
TCONT12		0.39	0.39			0.45
TCONT15		0.54	0.54			0.47
TCONT17		0.60	0.60			0.58
TCONT21		0.67	0.67			0.63
TCONT24		0.83	0.83			0.72
TCONT4	**(B)**ExamPrep	**0.20**	**0.20**	Moulding Orientation	ExamPrep	0.13
TCONT8		0.47	0.47			0.50
TCONT11		0.54	0.54			0.50
TCONT13		0.59	0.59			0.44
TCONT14		0.39	0.39			0.36
TCONT16		0.35	0.35			0.35
TCONT20		0.60	0.60			0.60
TCONT27		0.71	0.71			0.65
TCONT34		0.58	0.58			0.71
TCONT37		0.47	0.47			0.53
TCONT18	**(C)** AbilityDev	0.62	0.62		AbilityDev	0.59
TCONT22		0.45	0.45			0.54
TCONT23		0.69	0.69			0.68
TCONT28		0.67	0.67			0.69
TCONT29		0.58	0.58			0.59
TCONT30		0.67	0.67			0.63
TCONT32		0.68	0.68			0.64
TCONT2	**(D)**AttitudePro	**0.28**	**0.28**	Cultivating Orientation	AttitudePro	0.37
TCONT6		0.39	0.39			0.41
TCONT19		0.76	0.76			0.73
TCONT25		0.72	0.72			0.66
TCONT31		**-0.16**	**-0.16**			-0.10
TCONT35		0.73	0.73			0.81
TCONT36		0.64	0.64			0.59
TCONT3	**(E)** Condance	0.34	0.34		Condance	0.25
TCONT7		0.59	0.59			0.46
TCONT10		0.66	0.66			0.62
TCONT26		0.46	0.46			0.44
TCONT33		0.51	0.51			0.68

Note: items shown in bold are having a factor loading below the minimum level

The fit indices for the models tested are summarized in Table 4.4. Most of the five separate models except for ExamPrep (2.18) had a chi square to the degree of freedom ratio, $(\frac{x^2}{df})$, less than 5. A good model fit should have a ratio less than 5, therefore these values indicated a good fit of the models. GFI values of the five separate models showed moderate values. In general, a model is considered a good fit if it has a GFI value of 0.90 or above. Among these five separate models, only the One-Factor model of AttitudePro (RMSEA = 0.07) indicated reasonable fit with the data. The GFI and the AGFI values of all five separate models stand at just slightly lower than 0.90 indicating a moderate fit. The PGFI, which indicates the complexity of the models, showed consistently lower values as well, which means these models were complicated (Diamantoplous & Siguaw, 2000).

Another index of fit examined was RMSEA. It suggested that a model had a good fit if the value of RMSEA was equal to or less than 0.05. However, the RMSEA values for all five separate models were consistently higher than 0.05 values which means that the models were not fitting the data well.

Table 4. 4 Fit Indices for Five Separate Models and Five-Factor Models

	Five Separate Models					Five Factors Models	
	A	B	C	D	E		
INDICES	KnowDeli	ExamPrep	AbilityDev	AttitudePro	ConDance	Five - Factor	Hierarchical Model
Chi –Square (x^2)	33.50	76.18	24.5	17.34	7.06	1476.40	1290.55
Degree of Freedom (df)	20	35	14	14	5	629	625
$\frac{x^2}{df}$	1.68	2.18	1.75	1.23	1.41	2.35	2.07
Goodness of Fix Index (GFI)	0.88	0.79	0.87	0.91	0.86	0.44	0.50
Adjusted Goodness-of-fit Index (AGFI)	0.77	0.67	0.77	0.82	0.86	0.40	0.48
Parsimony Goodness-of-fit Index (PGFI)	0.48	0.52	0.44	0.46	0.32	0.40	0.44
Tucker-Lewis Index (TLI)	0.76	0.53	0.84	0.93	0.84	0.23	0,50
Comparative Fit Index (CFI)	0.83	0.63	0.89	0.95	0.92	0.27	0.54
Root Mean Square Error of Approximation (RMSEA)	0.14	0.15	0.12	0.07	0.09	0.16	0.14

When the five factors were put together in a single model, the Five-Factor Model, the fit indices, as presented in Table 4.4, showed lower values for the GFI, the AGFI, and the PGFI. This was partly due to the small sample used in this study (52 teachers) relative to the increased number of parameters estimated in the model. It also had a higher RMSEA value (0.16) which again indicated that the model was not fitting well. As for the Hierarchical Model (see Table 4.5), the GFI (0.50), the AGFI (0.43), and the PGFI (0.44) values indicated that the model did not fit the data well.

Diamantoplous and Siguaw (2000) claimed that values of GFI and AGFI should range between 0 and 1 and that values greater than 0.90 were usually taken as acceptable fits. If these are used as indicators of good fits, then all the authors' models (Five Separate models (A-E), Five-Factor model, and Hierarchical Model) reflect poor to moderate fit to the data and need to be modified. This can be done by testing several alternative models (AMs). According to Byrne, (2010, p. 8), 'researchers propose several alternative (competing) models, all of which are grounded in theory and following analysis of a single set of empirical data, he or she selects one model as most appropriate in presenting the sample data'. However because all of the five factor models needed to be simultaneously run in subsequent models (Path analysis and HLM models), a further four alternative models were tested to find a model that best fitted the data. Factors in these models were run simultaneously.

Confirmatory Factor Analysis of the Alternative Models

Four models were tested as the alternative models due to the poor loadings on the Goa and Walkins model. These were (a) One Factor Model, (b) Five Factor Orthogonal Model, (c) Five Factor Correlated Factor and, (d) Five Factor Hierarchical Model. These models were tested and run simultaneously to determine whether these models were more consistent with the sample data compared to Goa and Walkins models. Factor structures for these models are presented in Figure 4.3. Factor loadings and fit indices are presented in Tables 4.5 and 4.6 respectively.

Table 4. 5 Factor loadings of One-Factor Model, Five-Factor Orthogonal Model, Five-Factor Correlated, and Five- Factor Hierarchical Model

Models	One-Factor		Five-Factor Orthogonal		Five-Factor Correlated		Five-Factor Hierarchical
TCONT1	*0.15*	***TCONT1***	*0.08*	***TCONT1***	***R***	***TCONT1***	***R***
TCONT2	*0.28*	*TCONT5*	*0.33*	*TCONT5*	*0.44*	*TCONT5*	*0.43*
TCONT3	*0.24*	*TCONT9*	*0.49*	*TCONT9*	*0.56*	*TCONT9*	*0.55*
TCONT4	*0.12*	*TCONT12*	*0.39*	*TCONT12*	*0.50*	*TCONT12*	*0.49*
TCONT5	*0.43*	*TCONT15*	*0.54*	*TCONT15*	*0.52*	*TCONT15*	*0.52*
TCONT6	*0.42*	*TCONT17*	*0.60*	*TCONT17*	*0.51*	*TCONT17*	*0.53*
TCONT7	*0.55*	*TCONT21*	*0.67*	*TCONT21*	*0.65*	*TCONT21*	*0.66*
TCONT8	*0.41*	*TCONT24*	*0.83*	*TCONT24*	*0.76*	*TCONT24*	*0.77*
TCONT9	*0.55*	***TCONT4***	***0.20***	***TCONT4***	***0.13***	***TCONT4***	***0.12***
TCONT10	*0.69*	*TCONT8*	*0.47*	*TCONT8*	*0.41*	*TCONT8*	*0.41*
TCONT11	*0.49*	*TCONT11*	*0.54*	*TCONT11*	*0.49*	*TCONT11*	*0.50*
TCONT12	*0.49*	*TCONT13*	*0.59*	*TCONT13*	*0.40*	*TCONT13*	*0.41*
TCONT13	*0.40*	*TCONT14*	*0.39*	*TCONT14*	*0.39*	*TCONT14*	*0.39*
TCONT14	*0.39*	*TCONT16*	*0.35*	*TCONT16*	*0.31*	*TCONT16*	*0.31*
TCONT15	*0.52*	*TCONT20*	*0.60*	*TCONT20*	*0.54*	*TCONT20*	*0.53*
TCONT16	*0.31*	*TCONT27*	*0.71*	*TCONT27*	*0.66*	*TCONT27*	*0.66*
TCONT17	*0.54*	*TCONT34*	*0.58*	*TCONT34*	*0.72*	*TCONT34*	*0.72*
TCONT18	*0.59*	*TCONT37*	*0.47*	*TCONT37*	*0.62*	*TCONT37*	*0.62*
TCONT19	*0.75*	***TCONT18***	***0.62***	***TCONT18***	***0.57***	***TCONT18***	***0.58***
TCONT20	*0.53*	*TCONT22*	*0.45*	*TCONT22*	*0.48*	*TCONT22*	*0.51*
TCONT21	*0.66*	*TCONT23*	*0.69*	*TCONT23*	*0.70*	*TCONT23*	*0.71*
TCONT22	*0.49*	*TCONT28*	*0.67*	*TCONT28*	*0.68*	*TCONT28*	*0.68*
TCONT23	*0.72*	*TCONT29*	*0.58*	*TCONT29*	*0.66*	*TCONT29*	*0.63*
TCONT24	*0.78*	*TCONT30*	*0.67*	*TCONT30*	*0.61*	*TCONT30*	*0.61*
TCONT25	*0.70*	*TCONT32*	*0.68*	*TCONT32*	*0.65*	*TCONT32*	*0.63*
TCONT26	*0.49*	***TCONT2***	***0.28***	***TCONT2***	***0.33***	***TCONT2***	***0.30***
TCONT27	*0.66*	*TCONT6*	*0.39*	*TCONT6*	*0.41*	*TCONT6*	*0.42*
TCONT28	*0.69*	*TCONT19*	*0.76*	*TCONT19*	*0.75*	*TCONT19*	*0.75*
TCONT29	*0.64*	*TCONT25*	*0.72*	*TCONT25*	*0.69*	*TCONT25*	*0.69*
TCONT30	*0.62*	*TCONT31*	*-0.10*	*TCONT31*	***R***	*TCONT31*	***R***
TCONT31	*-0.12*	*TCONT35*	*0.73*	*TCONT35*	*0.79*	*TCONT35*	*0.79*
TCONT32	*0.64*	*TCONT36*	*0.64*	*TCONT36*	*0.58*	*TCONT36*	*0.58*
TCONT33	*0.71*	***TCONT3***	*0.34*	***TCONT3***	*0.23*	***TCONT3***	***0.21***
TCONT34	*0.72*	*TCONT7*	*0.59*	*TCONT7*	*0.47*	*TCONT7*	*0.48*
TCONT35	*0.78*	*TCONT10*	*0.66*	*TCONT10*	*0.63*	*TCONT10*	*0.64*
TCONT36	*0.58*	*TCONT26*	*0.46*	*TCONT26*	*0.43*	*TCONT26*	*0.43*
TCONT37	*0.61*	*TCONT33*	*0.51*	*TCONT33*	*0.68*	*TCONT33*	*0.67*

Note : R indicates the item was removed

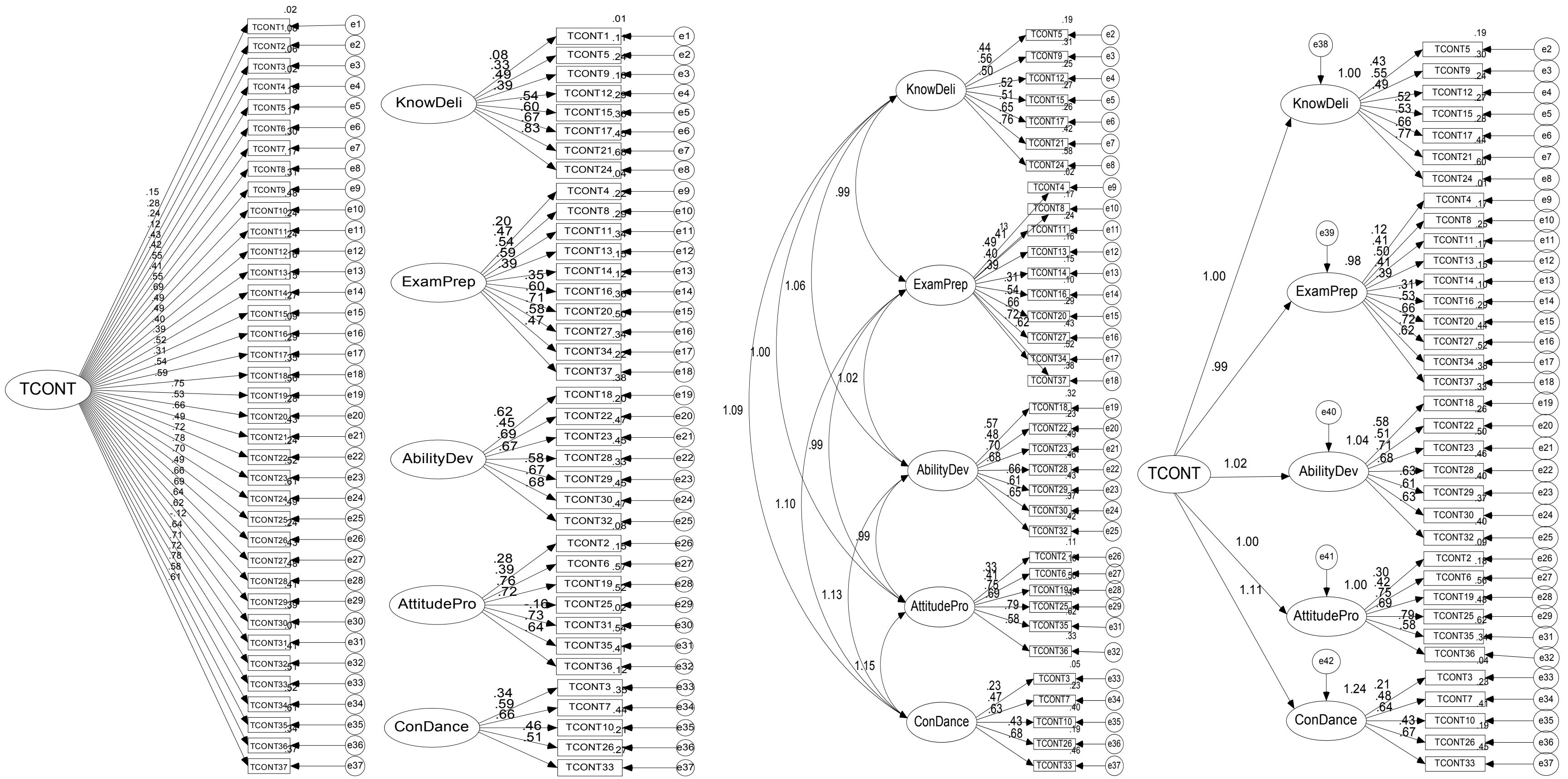

Figure 4. 2 (a) One Factor (b) Five Factor Orthogonal (c) Five Factor Correlated (d) Five Factor Hierarchical Models of TCONT

Table 4.5 shows the factor loadings for the alternative models; (a) One Factor Model, (b) Five Factor Orthogonal Model, (c) Five Factor Correlated Factor and, (d) Five Factor Hierarchical Models. Most of the factor loadings were higher than 0.30 (see Hair et al. 2010). However, there were a few factor loadings below 0.30, such as TCONT1 (0.15) and TCONT31 (-0.12) of One Factor Model, TCONT1 (0.08) and TCONT31 (-0.10) of Five Factor Orthogonal Model, and TCONT3 (0.23) of Five Factor Correlated Factor.

Two of these items TCONT1 (0.08) and TCONT31 (-0.10) were removed in the Five Factor Correlated Model and Five Factor Hierarchical Model because their loadings were below 0.3 (Hair, et. al., 2010). Curtis (2005) recommended that items be removed from the model if their standardized loadings were below 0.4. However, there were a number of items that were not removed, although the loadings were less than 0.4, because they were considered to provide important or unique information for this research (Ben, 2010). As this analysis used data based on Malaysian teachers' responses, the poor loadings might have been caused by the items not fitting the Malaysian context. Factor loadings for the Five Factor Correlated Model showed positive loadings (see Table4.5). These loadings were considered moderate indicating that the items were reasonable reflectors of the latent variables.

The loadings for the Five Factor Hierarchical Model showed much the same values as the Five-Factor Correlated Model. In summary, these analyses determined that all the factor loadings in both models were more than 0.30, although some of the correlations in the Five Factor Correlated Model and some of the loadings of the first-order factors in the Five Factor Hierarchical Models had values higher than 1.

Table 4. 6 Fit Indices of One-Factor Model, Five-Factor Orthogonal Model, Five-Factor Correlated, and Five-Factor Hierarchical Model

Models	One-Factor Model	Five-Factor Orthogonal	Five-Factor Correlated	Five-Factor Hierarchical
Chi –Square (x^2)	1210.661	1476.397	1049.224	1054.193
Degree of Freedom (df)	629	629	550	555
$\frac{x^2}{df}$	1.93	2.35	1.91	1.89
Goodness of Fix Index (GFI)	0.50	0.44	0.51	0.50
Adjusted Goodness-of-fit Index (AGFI)	0.43	0.40	0.44	0.44
Tucker-Lewis Index (TLI)	0.47	0.40	0.50	0.50
Comparative Fit Index (CFI)	0.50	0.22	0.54	0.53
Root Mean Square Error of Approximation (RMSEA)	0.13	0.16	0.13	0.13

Table 4.6 presented the fit indices for the One-Factor, Five-Factor Orthogonal, Five-Factor Correlated, and Five- Factor Hierarchical Models. The chi-square tests significant values relative to the degrees of freedom to indicate how well the models fit the data. Most of the alternative models had a ratio of chi square to the degree of freedom, ($\frac{x^2}{df}$) of less than 5. These values indicated that the models adequately fitted the data. A good model fit should have a ratio of less than 5. Using this statement as the guide line, the results show that the chi-square values have better values for the Five-Factor Hierarchical (1.89) of the alternative models which were run simultaneously, compared to the Goa and Wlkins model. Furthermore, the results of other fit indices such as the Root Mean Square Error of Approximation (RMSEA), Goodness of Fix Index (GFI), Adjusted Goodness-of-fit Index (AGFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) in the alternative models show results similar to the Goa and Walkins model. Overall, this

result indicates that the alternative models had a better fit compared to the authors' model. Therefore, these models were used for the subsequent analysis.

4.4 The Approaches to Teaching Inventory (APPROT) Instrument

This study also used the revised Approaches to Teaching Inventory (ATI) instrument as part of the teachers' questionnaire. ATI consists of 22 items measuring two scales of teaching approaches, namely conceptual change or student-focused (CCSF) and information transmission or teacher-focused (ITTF) in higher education. According to Trigwell and Prosser (2004), the focus of this instrument was to explore the relationships between teachers' approaches to teaching and students' approaches to learning in the classes of those teachers.

ATI was originally developed by Trigwell and Prosser (1999) with 16 items. The revised ATI contains 25 items, three of which 5, 20, and 24 were later removed by Trigwell et al. (2005, p. 357) because of the low standardized factor loadings. The revised ATI kept the two scales, CCSF and ITTF, with 11 items for each scale. Each item used a range of time-based engagements on a five-point scale: 1. Only Rarely 2. Sometimes 3. About Half the Time 4. Frequently 5. Almost Always (Trigwell et al., (2005).

CCSF contains items that focus on supporting students to become independent learners and on monitoring change in understanding (items 3,6,8,9,14,15,16,18,19,22,23).

ITTF contains items that focus on teachers' presentation and the importance of knowing content in teaching (items 1,2,4,7,10,11,12,13,17,21,25). Table 4.7 presents the items for each of the factors. Items were label APPROT in this study.

All the items in ATI instrument underwent the reliability and validity examination. The author of the questionnaire used CFA to assess the fit of the factor structure by using PRELIS 2.54. The goodness-of-fit of the instrument was assessed by the following indices: CFI (comparative fit index), NNFI (Non-normed fit index, also known as TLI), RMSEA (Root mean square error of approximation) and the SRMR (standardized root mean residual).

Table 4. 7 APPROT instrument subscales

Subscales		**Items**
CCSF	APPROT 3	In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying.
	APPROT 6	I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.
	APPROT 8	I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop
	APPROT 9	In teaching sessions in this subject, I use difficult or undefined examples to provoke debate.
	APPROT 14	I make available opportunities for students in this subject to discuss their changing understanding of the subject.
	APPROT 15	It is better for students in this subject to generate their own notes rather than always copy mine.
	APPROT 16	I feel a lot of teaching time in this subject should be used to question students' ideas.
	APPROT 18	I see teaching as helping students develop new ways of thinking in this subject.
	APPROT 19	In teaching this subject it is important for me to monitor students' changed understanding of the subject matter.
	APPROT 22	Teaching in this subject should help students question their own understanding of the subjects matter.
	APPROT 23	Teaching in this subject should help students find their own learning resources.
ITTF	APPROT 1	In this subject students should focus on what I provide them.
	APPROT 2	It is important that this subject should be completely described in terms of specific objectives that relate to formal assessment items.
	APPROT 4	It is important to present a lot of facts to students so that they know what they have to learn for this subject.
	APPROT 7	In this subject I concentrate on covering the information that might be available from key texts and readings.
	APPROT 10	I structure my teaching in this subject to help students to pass the formal assessment items.
	APPROT 11	I think an important reason for running teaching sessions in this subject is to give students a good set of notes.
	APPROT 12	In this subject, I provided the students with the information they will need to pass the formal assessments.
	APPROT 13	I should know the answers to any questions that students may put to me during this subject.
	APPROT 17	In this subjects my teaching focuses on the good presentation of information to students
	APPROT 21	My teaching in this subject focuses on delivering what I know to students.
	APPROT 25	I present material to enable students to build up an information base in this subject.

CFI and NNFI values were greater than 0.90, and RMSEA and SRMR were less than 0.08. These results indicated that the hypothesized model had good fit with the data (Spector cited in Trigwell, 2005). The author of the instruments also used Cronbach Alpha coefficients to determine the internal consistency in the ATI instruments. Both the subscales had alpha values greater than 0.70, which indicated that CCFS (0.86) and ITTF (0.83) had acceptable reliability. ATI had been widely used as an instrument for monitoring approaches to teaching at tertiary level. However, in this study the instrument was used at the school level. Since the instrument was being used in a different educational setting, it warranted revalidation. The following section discusses the ATI instrument's validation in detail.

4.5 Instrument Structure Analysis

CFA was carried out to examine how well the hypothesis model fitted the sample data. The analysis was based on the 52 teachers from 18 secondary schools in Kuala Lumpur, who were respondents of this research in Malaysia. AMOS version 17 was used to carry out CFA analyses for the original models (base line model) from the authors of the instrument and subsequently the analysis of the alternative models.

Confirmatory Factor Analysis of Trigwell , Prosser, and Ginns Model

This section discusses and reports the CFA of the authors' model. Trigwell and Posser (1999) constructed this model with two latent variables CCSF (conceptual change or student-focused) and ITTF (information transmission or teacher-focused). The results of the CFA are displayed using the tables of the fit indices to easily compare the models and to find which model had the best fit and the highest factor loading for the corresponding items. One-Factor model and Two-Factor Correlated models were tested. These models are presented in Figures 4.4 and 4.5, followed by the fit indices in Table 4.10.

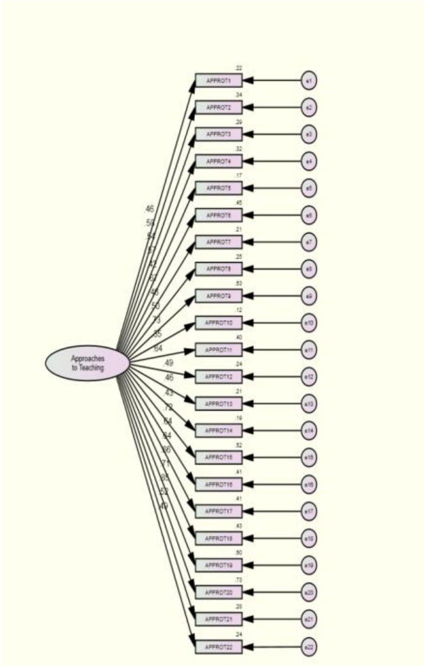

Figure 4. 3 One-Factor Model

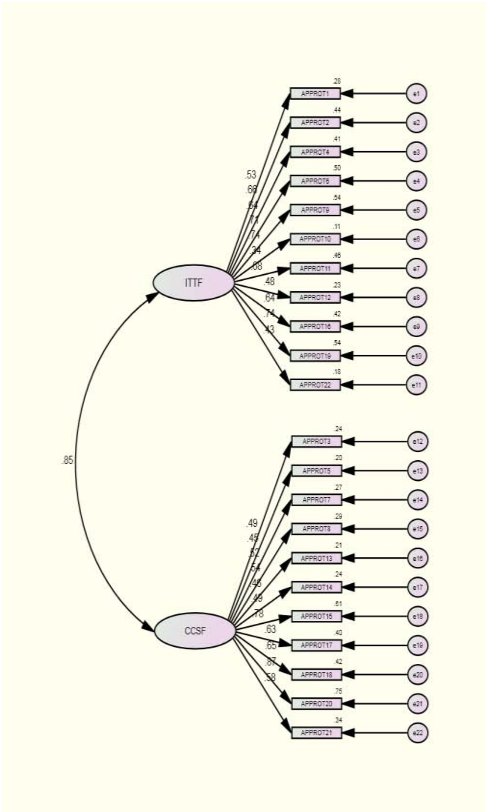

Figure 4. 4 Two-Factor Correlated Model

Table 4. 8 Factor Loadings for One-Factor Model

Items	Factor Loadings
APPROT1	0.46
APPROT2	0.58
APPROT3	0.54
APPROT4	0.57
APPROT5	0.42
APPROT6	0.67
APPROT7	0.46
APPROT8	0.50
APPROT9	0.73
APPROT10	0.35
APPROT11	0.64
APPROT12	0.49
APPROT13	0.46
APPROT14	0.43
APPROT15	0.72
APPROT16	0.64
APPROT17	0.64
APPROT18	0.66
APPROT19	0.71
APPROT20	0.85
APPROT21	0.52
APPROT22	0.49

Table 4. 9 Factor Loadings of Two-Factor Correlated Model

Items	**ITTF**	**CCSF**
APPROT1	0.53	
APPROT2	0.66	
APPROT4	0.64	
APPROT6	0.71	
APPROT9	0.74	
APPROT10	0.34	
APPROT11	0.68	
APPROT12	0.48	
APPROT16	0.64	
APPROT19	0.74	
APPROT22	0.43	
APPROT3		0.49
APPROT5		0.45
APPROT7		0.52
APPROT8		0.54
APPROT13		0.46
APPROT14		0.49
APPROT15		0.78
APPROT17		0.63
APPROT18		0.65
APPROT20		0.87
APPROT21		0.58

Table 4. 10 Fit Indices for the Factor Models

INDICES	One-Factor APPROT	Two-Factor Correlated APPROT
Chi –Square (x^2)	453	438
Degree of Freedom (df)	209	208
$\frac{x^2}{df}$	2.17	2.11
Goodness of Fix Index (GFI)	0.57	0.59
Adjusted Goodness-of-fit Index (AGFI)	0.48	0.50
Parsimony Goodness-of-fit Index (PGFI)	0.47	0.48
Tucker-Lewis Index (TLI)	0.54	0.57
Comparative Fit Index (CFI)	0.59	0.61
Root Mean Square Error of Approximation (RMSEA)	0.15	0.15

The results for the One-Factor Model are presented in Table 4.8. Most of the loadings are above 0.4 except for APPROT10 (0.35) Loadings which range from 0.50 to 0.80 indicate that the items have medium to strong factor loadings. However, the fit indices showed that this model has poor fit. An RMSEA value of 0.15 reflects a poor fit of the model. For a model to have a good fit, the value of RMSEA needs to be equal to or less than 0.05. The low values of the GFI (0.57), and the AFGI (0.48), also indicate that the model had a poor fit. Besides that, the value of PGFI (0.47) was less than 0.90 indicating that the model was not highly parsimonious with the data.

The results for the Two-Factor Correlated model shows that almost all the items have good factor loadings (see table 4.9). Hair et al., (2010, p.117) suggest that 'factor loadings in range of $\pm$ 0.30 to $\pm$0.40 are considered to meet the minimal level for interpretation of structure. Loadings $\pm$ 0.50 or greater are considered practically significant. Loadings exceeding 0.70 are considered indicative of well-defined structure and are the goal of any factor analysis'. Based on these indicators, it was found that the 22 items of the APRROT instrument were highly correlated. The Cronbach Alpha values for both subscales were acceptable, CCSF (0.85) and ITTF (0.85).

In contrast to the factor loadings the RMSEA value of 0.15 for this model indicates a poor fit of the model. This was based on levels suggested by Diamantoplous and Siguaw, (2000), who started that values of RMSEA less than 0.05 were accepted to indicate a good fit, values between 0.05 and 0.08 are reasonable fit and values between 0.08 and under 0.10 were a mediocre fit and values above 0.10 were a poor fit.

Similar indications can be drawn from the values of GFI (0.59), AGFI (0.50), and PGFI (0.48). These values were below 0.9 which indicated that the model had a poor fit. In summary, both models, One-Factor and Two-Factor Correlated Models had values indicating that neither model was having a good fit. Further investigation was carried out by examining alternative models to identify the structure that best fitted the data.

Confirmatory Factor Analysis of the Alternative Models

Four models were tested as the alternative models using AMOS (Version 17), namely; (a) One Factor Model, (b) Two Factor Orthogonal Model, (c) Two Factor Correlated Model and, (d) Two Factor Hierarchical Model (see Figure 5.6). The models tested were restructured by the researcher due to low fit indices of both initial models. According to Mathews (2004) restructuring means that the manifest variables are relocated on different latent variable in order to improve the model fit. 'Hierarchical model was tested to examine if the two factors loaded on to the second order factor', the Approaches to Teaching factor (Curtis, 2004, p.186). The way this instrument was restructured is presented Table 4.11.

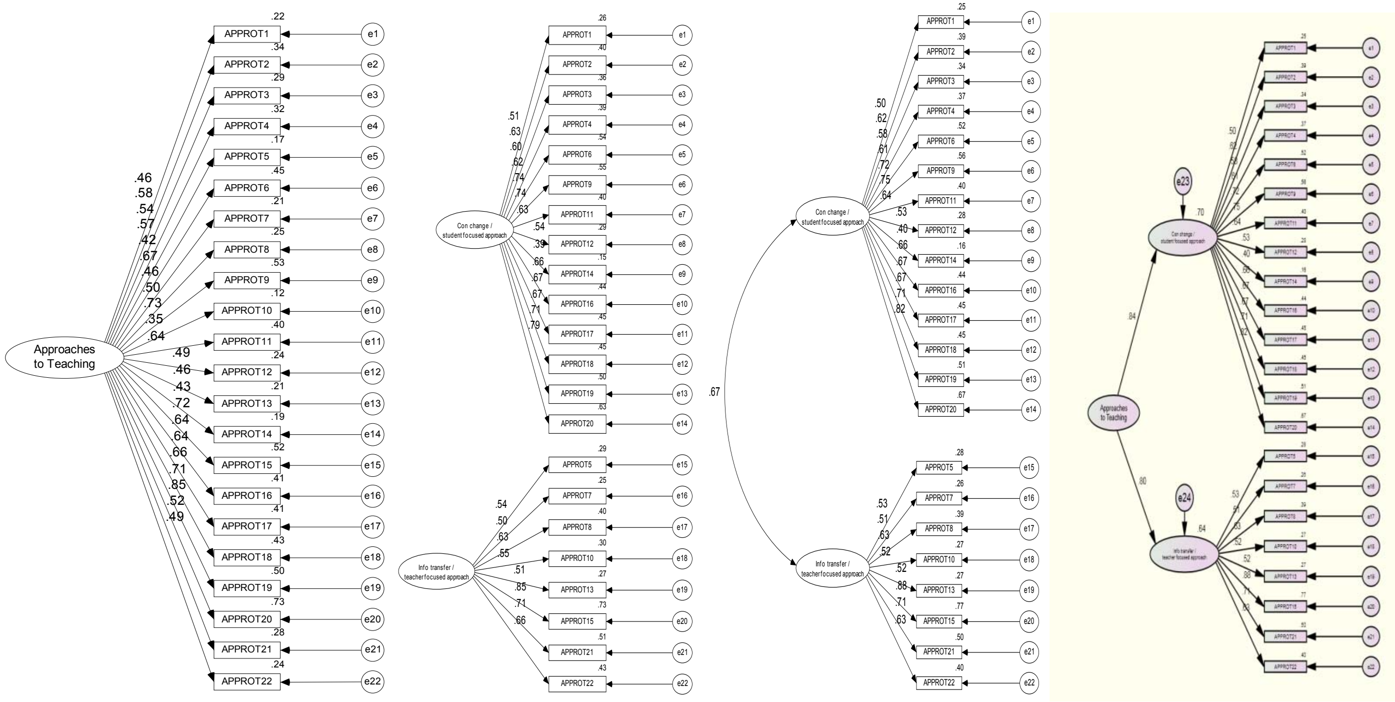

Figure 4. 5 (a) One Factor (b) Two Factor Orthogonal (c) Two Factor Correlated (d) Two Factor Hierarchical Models of APPROT

No items were dropped in the new structure. The two subscales ITTF and CCSF were retained; however a few items were reassigned. In the restructured factors: the ITTS subscales had 14 items (APPROT1, APPROT2, APPROT3, APPROT4, APPROT6, APPROT9, APPROT11, APPROT12, APPROT14, APPROT16, APPROT17, APPROT18, APPROT19, APPROT20) while the ITTF subscale had 8 items (APPROT5, APPROT7 APPROT8, APPROT10, APPROT13, APPROT15, APPROT21, APPROT22). In the initial structure both scales had 11 items each (see also Table 4.8).

Table 4. 11 Factor Loadings of the Restructured Two-Factor Correlated and Two-Factor Hierarchical Models

Items	**Sub-scales**	**Two-Factor Correlated Model**	**Hierarchical Model**
		Loadings	Loadings
APPROT1	**ITTF**	0.50	0.50
APPROT2		0.62	0.62
APPROT3		0.53	0.53
APPROT4		0.61	0.61
APPROT6		0.72	0.72
APPROT9		0.75	0.75
APPROT11		0.64	0.64
APPROT12		0.53	0.53
APPROT14		0.40	0.40
APPROT16		0.66	0.66
APPROT17		0.67	0.67
APPROT18		0.67	0.67
APPROT19		0.71	0.71
APPROT20		0.82	0.82
APPROT5	**CCSF**	0.53	0.53
APPROT7		0.51	0.51
APPROT8		0.83	0.83
APPROT10		0.52	0.52
APPROT13		0.52	0.52
APPROT15		0.88	0.88
APPROT21		0.71	0.71
APPROT22		0.63	0.63

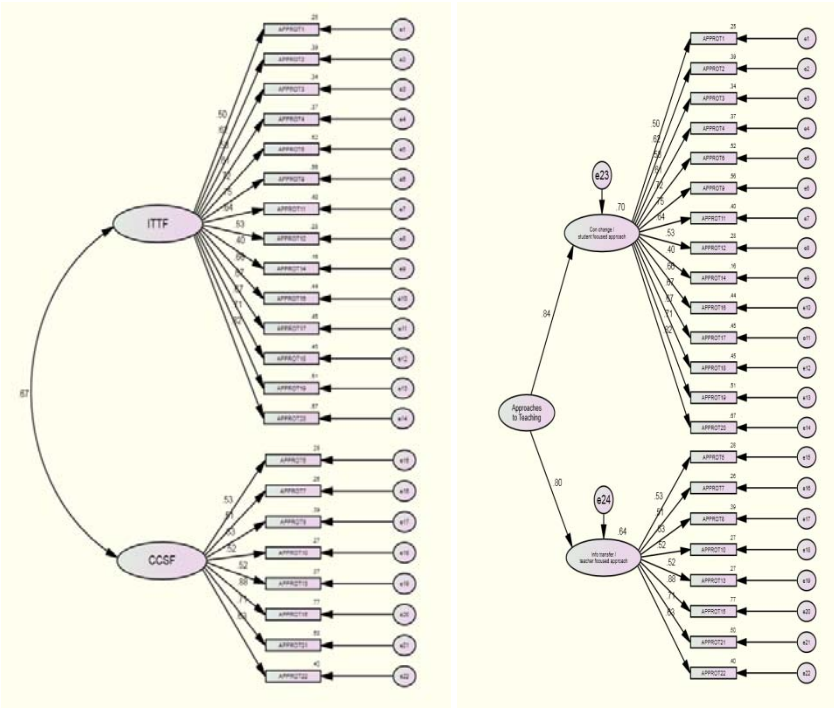

Figure 4. 6 Two-Factor Correlated and Two - Factor Hierarchical Model

Out of four alternative models tested, two models showed adequate values to fit the sample data. The models were Two-Factor Correlated and Two Factor Hierarchical models. Both models had similar values in factor loadings and fit indices. The Two Factor Hierarchical Model was finally chosen in order to reduce the complexity of the path models in the subsequent analyses. The structure of Two-Factor Correlated and Two Factor Hierarchical models are presented in Figure 4.7. The fit indices are presented in Table 4.13.

The factor loading for the Restructured Two-Factor Correlated and Two-Factor Hierarchical Model are presented in Table 4.11. All factor loadings for the Two-Factor Correlated range from 0.50 to 0.88 which indicates that the items are strongly correlated. The correlation between the two latent variables (ITTF and CCSF) is high

(0.67). The factor loadings for both the Hierarchical Model and the Two-Factor Correlated Model are identical. The fit indices presented in Table 4.12 are also identical.

Table 4. 12 Fit Indices for the Two-Factor Correlated and Hierarchical Models

INDICES	Two-Factor Correlated APPROT	Hierarchical Model APPROT
Chi –Square (x^2)	400	400
Degree of Freedom (df)	208	208
$\frac{x^2}{df}$	1.93	1.93
Goodness of Fix Index (GFI)	0.62	0.62
Adjusted Goodness-of-fit Index (AGFI)	0.54	0.54
Parsimony Goodness-of-fit Index (PGFI)	0.51	0.51
Tucker-Lewis Index (TLI)	0.64	0.64
Comparative Fit Index (CFI)	0.67	0.67
Root Mean Square Error of Approximation (RMSEA)	0.13	0.13

The chi-square to the degree of freedom ratio is below 2 indicating a good fit, however, the RMSEA value is slightly above 0.09. Even though the values of GFI (0.62) and AGFI (0.54) of the reconstructed models were still below 0.9, they did indicate an improved fit compared to the Trigwell, Prosser, and Ginns model (Prosser & Trigwell, 1999). Meanwhile, PGFI showed a similar low value (0.51), and Diamantoplous & Siguaw, (2000) suggested that 'GFI value are recommended as the most reliable measure of absolute fit in most circumstances' (Diamantoplous & Siguaw, 2000, p. 87). Based on these better values, it can be concluded that the restructured Two-Factor Correlated and Hierarchical Models fit the data better, compared to Prosser & Trigwell, (1999) models. Although the Hierarchical Model had similar fit indices to the Two-Factor Correlated model, the Hierarchical Model was chosen to be used in the Path Analysis in order to simplify the Path model.

4.6 History Teaching Method (HTEAM) Instrument

This instrument consisted of 19 items which reflected the History teaching methods used in Malaysian classrooms. This questionnaire was developed by the researcher, based on the literature review of pedagogical methods used by the History teacher in the classroom. There were two subscales in the instrument; active and effective teaching. Active teaching consisted of 7 items (HTEAM1 to HTEAM7). Effective teaching consisted of 12 items (HTEAM 8 to HTEAM 19). Each item used a five-point scale: 1. Never 2. Seldom 3. Sometime 4. Often 5. Very Often. The subscales of HTEAM are presented in Table 4.13. All the items in the questionnaire were subject to the reliability analysis. Sekaran (1992), claimed that reliability measurement indicated the stability and consistency with which scores were obtained from an instrument. In this study, Cronbach Alpha was used to examine the internal consistency of the questionnaires. Yu (n.d.) defined Cronbach Alpha as 'a measure of squared correlation between observed score and true score'. Cronbach Alpha indicates the internal consistency of a questionnaire. The value of Cronbach's Alpha for scale of the teachers' samples was 0.9.

Table 4. 13 HTEAM instrument subscale

Subscales		Items
		In teaching History in your classroom how often do you do the following activities?
ActTea	1	Role play/ Drama.
	2	Classroom Discussion.
	3	Debate.
	4	Student Presentation.
	5	Group work.
	6	Project work.
	7	Field Trips.
EffTea	8	I know how to select and structure historical knowledge for instructional purposes.
	9	I know how to use a wide range of strategies and approaches for representing history.
	10	I know how to use historical knowledge to foster critical thinking.
	11	I teach history as possible interpretations of the past rather than as fact.
	12	During a history lesson I involve students in working with raw materials (newspaper, photographs, political cartoon, letters, etc).
	13	I require students to connect and relate various pieces of evidence to build images of the past
	14	I provide students with opportunities to practise critical thinking skills likes (e.g.; document-based questioning).
	15	I teach students to analyse primary and secondary source documents during history class.
	16	I encourage students to use tools of inquiry such as interrogation, analysis, and interpretation.
	17	I Introduce students to investigative processes and skills of handling, reading, and evaluating evidence.
	18	I am aware that learning history is a social activity through which students learn from each other.
	19	I recognise that gradually building the context for history inquiry is essential for learning.

4.7 Instrument Structure Analysis

Confirmatory Factor Analysis of the Initial Model

The Two-Factor Correlated Model was tested with CFA. The initial instrument had 19 items and two sub-scales, namely the EffTea (Effective Teaching) and the ActTea (Active Teaching) subscales as presented in Table 4.13. CFA was used to examine how well the observed variables were measuring the latent variables as indicated by the instrument. The results of CFA are displayed in Tables 4.14 and 4.15. The factor structure is presented in Figure 4.8; the factor loadings and the fit indices are presented in Tables 4.15 and 4.16.

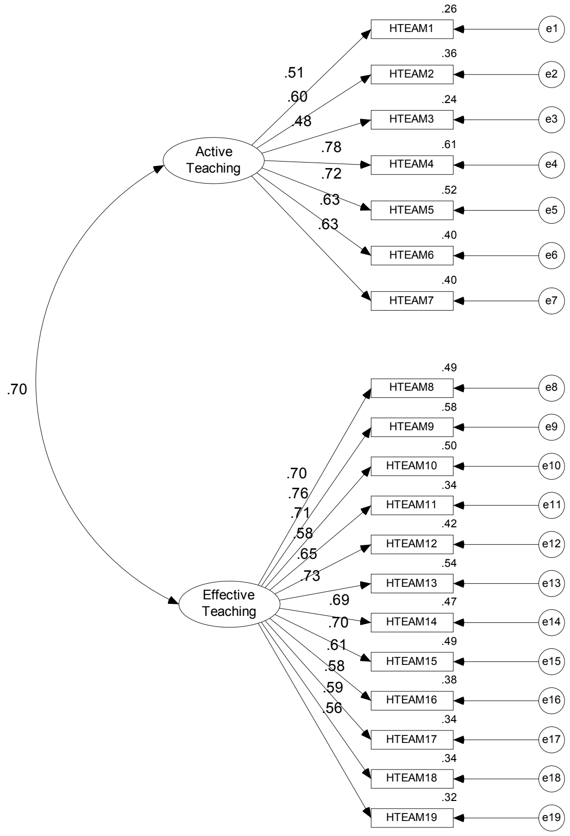

Figure 4. 7 Two-Factor Correlated Model

Table 4. 14 Factor Loadings of Two-Factor Correlation Initial Structure

Item no.	Sub-scale	Factor Loadings
HTEAM1	ActTea	0.51
HTEAM2		0.60
HTEAM3		0.48
HTEAM4		0.78
HTEAM5		0.72
HTEAM6		0.63
HTEAM7		0.63
HTEAM8	EffTea	0.70
HTEAM9		0.76
HTEAM10		0.71
HTEAM11		0.58
HTEAM12		0.65
HTEAM13		0.73
HTEAM14		0.69
HTEAM15		0.70
HTEAM16		0.61
HTEAM17		0.58
HTEAM18		0.59
HTEAM19		0.56

All the factor loadings in this model were more than 0.50. There was a strong correlation (0.70) between the two latent variables (EffTea and ActTea).

Table 4. 15 Fit Indices for the Two-Factor Correlated Initial Structure

INDICES	Two-Factor Correlated HTEAM
Chi –Square (x^2)	282
Degree of Freedom (df)	152
$\frac{x^2}{df}$	1.89
Goodness of Fit Index (GFI)	0.66
Adjusted Goodness-of-fit Index (AGFI)	0.58
Parsimony Goodness-of-fit Index (PGFI)	0.53
Tucker-Lewis Index (TLI)	0.69
Comparative Fit Index (CFI)	0.72
Root Mean Square Error of Approximation (RMSEA)	0.13

The RMSEA value for the Two-Factor Correlated Initial model was 0.13. This value indicates a poor fit to the model. This was based on the indicator suggested by Diamantoplous and Siguaw (2000); that RMSEA values of less than 0.05 are accepted to indicate a good fit, values between 0.05 and under 0.08 are reasonable fit and values between 0.08 and under 0.10 are mediocre fit and values above 0.10 are a poor fit. Similar results showed in GFI (0.66), AGFI (0.58), and PGFI (0.53) where all these values were below 0.9. These too indicated that the model was poorly fitting the data. In summary, the Two-Factor Correlated Initial model did not fit the data well. Further testing was carried out with the alternative models to identify which alternative structures had the best fit indices.

Exploratory Factor Analysis (EFA) of the Initials Models

Since this instrument was developed by the researcher, Exploratory Factor Analysis (EFA) was conducted to tease out the possible groupings of the items. In addition CFA was also implemented to confirm the structure of the instrument. According to Curtis (2005, p.183), EFA is used to 'show the patterns of response to the items of the instrument reflect the constructs that were used in framing the instrument'. In this study EFA was employed, using principal components extraction, followed by varimax rotation, using SPSS version 17.

Table 4. 16 Rotated factor solution for an exploratory analysis of the HTEAM

Item no.	Sub-scale	Factor 1	Factor 2
HTEAM1	EffTea	0.46	
HTEAM8		0.60	
HTEAM9		0.56	
HTEAM10		0.77	
HTEAM11		0.72	
HTEAM12		0.68	
HTEAM13		0.68	
HTEAM14		0.66	
HTEAM15		0.58	
HTEAM18		0.67	
HTEAM19		0.70	
HTEAM2	ActTea		0.72
HTEAM3			0.51
HTEAM4			0.79
HTEAM5			0.69
HTEAM6			0.65
HTEAM7			0.58
HTEAM16			0.65
HTEAM17			0.62

Factor loadings for the HTEAM instrument are presented in Table 4.16. The magnitude of the factor loadings indicate that the items moderately reflected the subscales that they were intended to reflect. However, there were a few exceptions in these results.

Item HTEAM1 was planned as an ActTea (Active Teaching) item, but loaded into EffTea (Effective Teaching) scale instead. The item referred to feedback on the active teaching that teacher would implement in the classroom (Taylor & Young, 2003). Items HTEAM16 and HTEAM17 which were initially designed to be part of the EffTea (Effective Teaching) sub-scale had loadings of moderate size onto the ActTea (Active Teaching) sub-scale. Overall, this analysis showed a satisfactory pattern of loadings, suggesting that most of the items reflected the constructs that were claimed by Taylor and Young (2003) to form the History teaching methods used in the classroom.

Although EFA showed that most of the items did reflect the constructs concerned and that the instrument itself had coverage of the items that were implicated in History teaching methods, EFA has its own limitations. Curtis (2005, p. 185) pointed out that EFA fails to show the constructs that form a certain concept. He added that 'in varimax factor solution, each extracted factor is orthogonal to the others and therefore EFA does not provide a basis for arguing that the identified constructs form a unidimensional construct that is a the basis of true measurement'. Due to these limitations, CFA was carried out further in this study to determine the structure of the constructs.

Confirmatory Factor Analysis of the Alternative Model

EFA was carried out in order 'to explore possible underlying structure of a set of observed variables without imposing any preconceived structure on the outcome and by performing EFA, the numbers of constructs and underlying factors are identified' (Child, 1990, cited in Suhr , 2006 p. 2). Using constructs from the EFA, four models were tested as alternative models namely; a) One Factor Model, (b) Two Factor Orthogonal

Model, (c) Two Factor Correlated Model and, (d) Two Factor Hierarchical Models (see Figure 4.9). AMOS 17 was used to carry out the CFA and to draw the factor structures. Two out of four alternative models, are discussed in this section: the Two-Factor Correlated and Two-Factor Hierarchical models due to the high values of the factor loadings and the values of the fit indices.

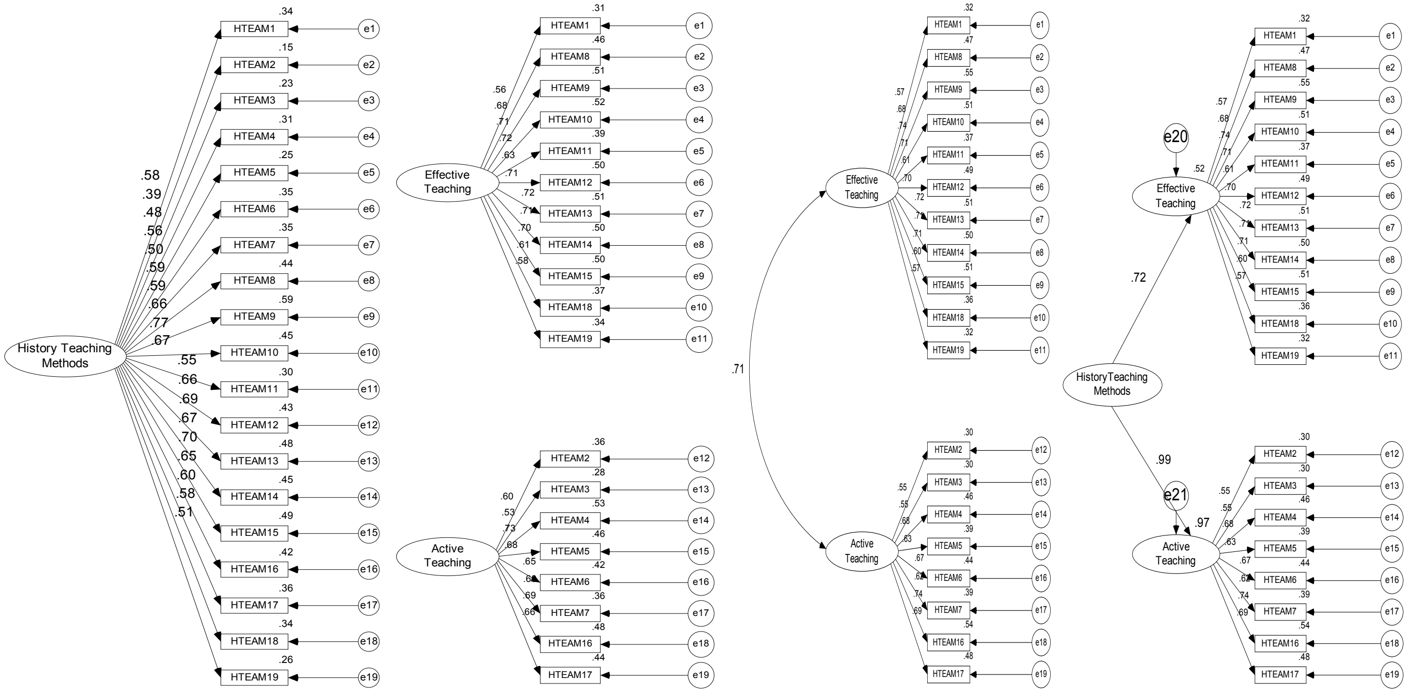

Figure 4. 8 (a) One Factor (b) Two Factor Orthogonal (c) Two Factor Correlated (d) Two Factor Hierarchical Models of HTEAM

The instrument consisted of 19 items; EffTea (Effective Teaching) had 11 items and ActTea (Active Teaching) had 8 items. The Two-Factor Correlated Model was tested to determine the fit of the hypothesis model to the sample data. The results of CFA are displayed in the factor loadings table (Table 4.17) and in the fit indices table (Table 4.18). The factor structure is presented in Figure 4.10.

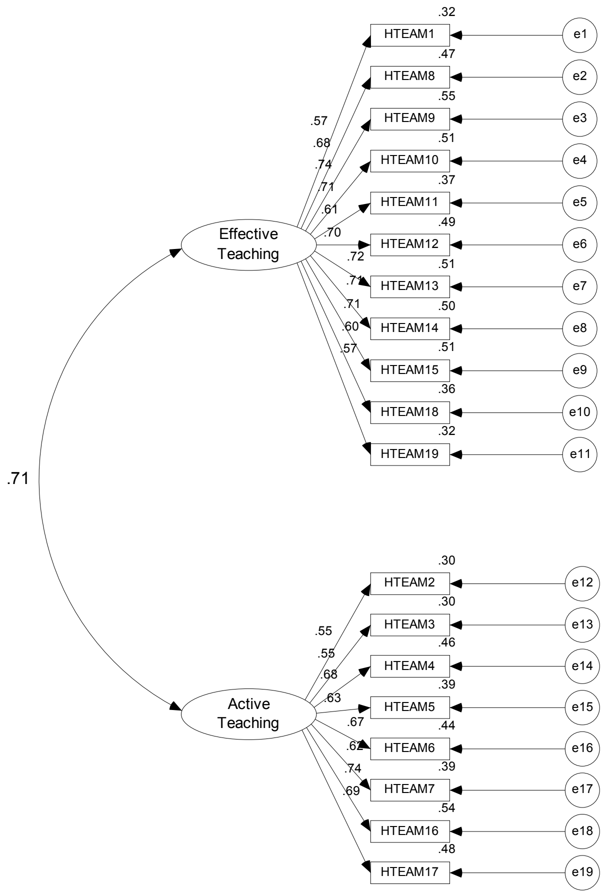

Figure 4. 9 Two-Factor Correlated Model

Table 4. 17 Factor Loadings of Two-Factor Correlated (New Structure) and Hierarchical Model

Item no.	Sub-scale	Two – Factor Correlated Model		Hierarchical Model	
		Factor 1	Factor 2	Factor 1	Factor 2
HTEAM1	EffTea	0.46		0.57	
HTEAM8		0.60		0.68	
HTEAM9		0.56		0.74	
HTEAM10		0.77		0.71	
HTEAM11		0.72		0.61	
HTEAM12		0.68		0.70	
HTEAM13		0.68		0.72	
HTEAM14		0.66		0.71	
HTEAM15		0.58		0.71	
HTEAM18		0.67		0.60	
HTEAM19		0.70		0.57	
HTEAM2	ActTea		0.72		0.55
HTEAM3			0.51		0.55
HTEAM4			0.79		0.68
HTEAM5			0.69		0.63
HTEAM6			0.65		0.67
HTEAM7			0.58		0.62
HTEAM16			0.65		0.74
HTEAM17			0.62		0.69

The loadings for the Two-Factor Correlated and Hierarchical Models as presented in Table 4.17 ranged from 0.46 to 0.79, showing that the items moderately reflected the latent variable. The correlation between the two latent variables (EffTea and ActTea) is high (r=0.71). The correlation coefficient, for this model were slightly higher compared to the Two-Factor Initial model (0.70). The loadings for the Hierarchical Model showed the same values as the Two-Factor Correlated Model. In summary, these models, to some extent, are improvement to the initial models. The fit indices of Two-Factor Correlated and Hierarchical Models are presented in Table 4.18.

Table 4. 18 Fit Indices for the Two-Factor Correlated and Hierarchical Models (New Structure)

INDICES	Two-Factor Correlated HTEAM	Hierarchical Model
Chi –Square (x^2)	269	269
Degree of Freedom (df)	151	151
$\frac{x^2}{df}$	1.79	1.79
Goodness of Fit Index (GFI)	0.68	0.68
Adjusted Goodness-of-fit Index (AGFI)	0.59	0.59
Parsimony Goodness-of-fit Index (PGFI)	0.54	0.54
Tucker-Lewis Index (TLI)	0.72	0.72
Comparative Fit Index (CFI)	0.75	0.75
Root Mean Square Error of Approximation (RMSEA)	0.12	0.12

The chi-square to the degree of freedom ratios for the Two-Factor Correlated (1.79) and Hierarchical (1.79) Models were below the suggested level of 2 indicating the models fit the data well. However, the RMSEA (0.12) values were still above the suggested levels indicating poor fit of these models. Other indicators that were used to determine the fit of the model are GFI, AGFI and PGFI indices. The GFI, AGFI and PGFI values of 0.68, 0.59, and 0.54 for both models also indicated a moderate level of fit. However, among the tested models, the revised Two-Factor and Hierarchical Models were the best fitting models. Although these models had similar indices, the Hierarchical Model was chosen in order to simplify the Partial Least Square analysis (PLS) in this study.

4.8 Summary

In this chapter the validations of the three questionnaires that formed the teachers' instrument in this study are discussed. The three questionnaires include (a) the teachers' conceptions of teaching (TCONT), (b) the teachers' approaches to teaching (LACH), and

(c) the teachers' History teaching methods (HTEAM). Each questionnaire underwent the same validation procedures using Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). Two sets of models were discussed in detail for all questionnaires: the Baseline Confirmatory and Alternative Models. CFA considered factor loadings and model fit indices. All instruments were tested to determine if the model fitted the sample data. Finally, in each case one of the alternative models which had the best fit was selected for further analysis. Across the three questionnaires of the teachers' instrument, the models chosen for further study were as follow:

1. The Teachers' Approaches to Teaching scale were applied in this study to assess teachers' conception of teaching in order to discover the relations of conceptions and student learning Goa & Watkins, (2002). After examining the CFA results of all the alternative models, it was decided to use the Hierarchical Model in subsequent analysis in this research.

2. The Approaches to Teaching Inventory (ATI - 22) was used to measure the relationship between students' approaches to learning and teachers' approaches to teaching (Prosser et al., 2006). The Hierarchical Model was chosen for the further analysis.

3. The History Teaching Method (HTEAM) Instrument was developed by the researcher to investigate the History teaching methods used in the classroom. Based on both EFA and CFA analyses, it was decided to use the Hierarchical Model in subsequent analysis.

Chapter 5 Validation of the Research Instruments: Students'

5.1 Introduction

This chapter continues the validity and reliability testing of the instruments used in this study. The students' instrument was tested using Confirmatory Factor Analysis (CFA) to examine its construct validity, while the internal consistency was measured with the Cronbach's Alpha coefficient. The analyses were based on data collected from 1653 students studying History in secondary schools across Kuala Lumpur.

The students' questionnaire comprised of four sections. Section 1 collected respondents' personal information. Section 2 of the questionnaire was designed to gather information on their History classroom climate (ICEQ). Section 3 was used to explore students' learning process (LPQ). In section 4, students' perception towards learning History (SPERCH) was the focus of inquiry.

Model Fit Indices

The results from the CFA analyses provided various fit indices such as the Mean Square Error of Approximation (RMSEA), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI). According to Ben (2010, p. 100), these indices 'assess how well the samples' covariance were reproduced by the covariance are predicted from the parameter estimates'. A value from RMSEA shows 'how well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available' (Diamantoplous & Siguaw, 2000, p. 85). Values of RMSEA less than 0.05 are accepted to indicate a good fit, values between 0.05 and 0.08 indicate a reasonable fit values between 0.08 and under 0.10 a mediocre fit and values lower than 0.10 show a poor fit (Diamantoplous & Siguaw, 2000). Other indicators used in this study were CFI and TLI, where values greater than or equal to 0.90 reveal good fit to the data. The CFI, TLI and RMSEA values are preferred by many researchers for a one time analysis (Schreiber, et al. 2006).

Besides the goodness of fit indicators mentioned above, chi-square divided by the number of degrees of freedom is also used as an indicator of goodness-of-fit in this study. Al-Gahtani and King (1999, cited in Darmawan 2003, p. 96) added that 'values of the chi-square to the number of degree of freedom of less than 5 for a larger model can be considered an indicator of a good fit'. Other indices that can be used are GFI, AGFI and PGFI. However, since the students' data missing values, these indices were not provided as part of AMOS output. The summary of the fit indexes used for the students' instrument is presented in Table 5.1.

Table 5. 1 Summary of fit indices used in validation of the scales in students' instruments

Fix Index	**Values to indicate Good Fit**
Root Mean Square Error of Approximation (RMSEA)	≤0.05
Comparative fit index (CFI)	≥ 0.90
Tucker-Lewis Index (TLI)	≥ 0.90
$\frac{x^2}{df}$	< 5

5.2. The Individualised Classroom Environment Questionnaire (ICEQ)

ICEQ was developed by Barry Fraser (1990). Originally ICEQ was used to measure Physics students' experiences in a Physics classroom. However, in this study ICEQ is used to determine History students' experiences in a History classroom. Therefore, some of the items were reworded to suit the context of the present study. This instrument had two forms, a long form with 50 items and a short form with 25 items. This study used the short form, because it was more 'economical and took less time to administer' (Fraser, 1990, p. 1).

The ICEQ instrument has two components called the Actual Classroom Environment and the Preferred Classroom Environment. The instrument consists of 25 items (for both Actual Classroom and Preferred Classroom) and each component contains five scales: personalisation, participation, independence, investigation and differentiation. Each scale had five items that use the five-point Likert type-scale responses of: 1. Never 2. Seldom 3. Sometime 4. Often 5. Very often. For the purpose of the data analysis the items were given different prefixes as follows: For the Actual Classroom component; CCAPER for personalisation, CCAPAR for participation, CCAIND for independence CCAINV for investigation, and CCADFR for differentiation. For the Preferred Classroom component; CCPPER for personalisation, CCPPAR for participation, CCPIND for independence CCPINV for investigation, and CCPDFR for differentiation. 'Nine out of the 25 items in the ICEQ instrument were negatively worded and needed to be recoded in order to keep the scoring consistent' (Fraser, 1990, p. 6). Tables 5.2 and 5.3 showed the summary of items used in this study.

Table 5. 2 Summary of ICEQ items used in the Students' Questionnaire (Actual Classroom)

Item Code	Nature of Statement	Item code to indicate Reverse scoring	Item statement
CCAPER1	Positive	None	The teacher talks with each student.
CCAPAR2	Positive	None	Students give their opinions during discussions
CCAIND3	Negative	CCAIND3R	The teacher decides where students sit.
CCAINV4	Negative	CCAINV4R	Students find out the answers to questions from textbooks rather than from history inquiry.
CCADFR5	Positive	None	Different students do different work.
CCAPER6	Positive	None	The teacher takes a personal interest in each student
CCAPAR7	Negative	CCAPAR7R	The teacher lectures without students asking or answering questions.
CCAIND8	Positive	None	Students choose their partners for group work.
CCAINV9	Positive	None	Students carry out history inquiry to check evidence
CCADFR10	Negative	CCADFR10R	All students in the class do the same work at the same time
CCAPER11	Negative	CCAPER11R	The teacher is unfriendly to students.
CCAPAR12	Positive	None	Students' ideas and suggestions are used during classroom discussion
CCAIND13	Negative	CCAIND13R	Students are told how to behave in the classroom
CCAINV14	Positive	None	Students carry out history inquiry to answer questions coming from class discussions.
CCADFR15	Positive	None	Different students use different books and materials.
CCAPER16	Positive	None	The teacher helps each student who is having trouble with the work
CCAPAR17	Positive	None	Students ask the teacher questions.
CCAIND18	Negative	CCAIND18R	The teacher decides which students should work together.
CCAINV19	Positive	None	Students explain the meanings of statements and time line.
CCADFR20	Positive	None	Students who work faster than others move on to the next topic.
CCAPER21	Positive	None	The teacher considers students' feelings.
CCAPAR22	Positive	None	There is classroom discussion
CCAIND23	Negative	CCAIND23R	The teacher decides how much movement and talk there should be in the classroom.
CCAINV24	Positive	None	Students carry out history inquiry to answer questions which puzzle them.
CCADFR25	Negative	CCADFR25R	The same teaching aid (e.g. blackboard or overhead projector) is used for all students in the class.

Table 5. 3 Summary of ICEQ items used in the Students' Questionnaire (Preferred Classroom)

Item Code	Nature of Statement	Item code to indicate Reverse scoring	Item statement
CCPPER1	Positive	None	The teacher would talk with each student.
CCPPAR2	Positive	None	Students would give their opinions during discussions
CCPIND3	Negative	CCPIND3R	The teacher would decide where students sit.
CCPINV4	Negative	CCPINV4R	Students would find out the answers to questions from textbooks rather than from history inquiry.
CCPDFR5	Positive	None	Different students would do different work.
CCPPER6	Positive	None	The teacher would takes a personal interest in each student
CCPPAR7	Negative	CCPPAR7R	The teacher would lecture without students asking or answering questions.
CCPIND8	Positive	None	Students would choose their partners for group work.
CCPINV9	Positive	None	Students would carry out history inquiry to check evidence
CCPDFR10	Negative	CCPDFR10R	All students in the class would do the same work at the same time
CCPPER11	Negative	CCPPER11R	The teacher would be unfriendly to students.
CCPPAR12	Positive	None	Students' ideas and suggestions would be used during classroom discussion
CCPIND13	Negative	CCPIND13R	Students would be told how to behave in the classroom
CCPINV14	Positive	None	Students would carry out history inquiry to answer questions coming from class discussions.
CCPDFR15	Positive	None	Different students would use different books and materials.
CCPPER16	Positive	None	The teacher would help each student who is having trouble with the work
CCPPAR17	Positive	None	Students would ask the teacher questions.
CCPIND18	Negative	CCPIND18R	The teacher would decide which students should work together.
CCPINV19	Positive	None	Students would explain the meanings of statements and time line.
CCPDFR20	Positive	None	Students who work faster than others move on to the next topic.
CCPPER21	Positive	None	The teacher would consider students' feelings.
CCPPAR22	Positive	None	There would be classroom discussion
CCPIND23	Negative	CCPIND23R	The teacher decides would how much movement and talk there should be in the classroom.
CCPINV24	Positive	None	Students would carry out history inquiry to answer questions which puzzle them.
CCPDFR25	Negative	CCPDFR25R	The same teaching aid (e.g. blackboard or overhead projector) is used for all students in the class.

ICEQ is widely used in several different countries and for different purposes. Fraser (p. 16, 1990) explained in the ICEQ Handbook that ICEQ had been tested in a few countries, using cross-validation procedures. The findings from the cross-validation data from Australia, Indonesia, and the Netherlands demonstrated the internal consistency and scale independence of both forms (long and short) of the ICEQ instrument. For the short form, the alpha coefficients range between 0.63 to 0.85. Fraser added that the results indicated that the reliability of the short form of a scale was typically approximately 0.1 smaller that the reliability of the corresponding long form. According to Fraser, these results reflected that the short form component had a satisfactory reliability based on the class mean. As for the correlation of the five scales, the findings showed values ranging from 0.13 to 0.36. These value indicated that the short form had an adequate level of scale independence. For the test-retest reliability coefficient, the five scales of ICEQ were: Personalisation (0.78), Participation (0.67), Independence (0.83), Investigation (0.75) and Differentiation (0.78). These results indicated that ICEQ had satisfactory reliability. The following section discusses in detail the ICEQ instrument validation using CFA.

5.3 Instrument Structure Analysis

The CFA modeling was based on the sample of 1653 students from this study. AMOS 17 (Arbuckle, 2008) was used to carry out CFA and for drawing the structure diagrams in this analysis. CFA was carried out to test the existing models and, subsequently, a number of alternative models in order to determine the best fitting model.

Confirmatory Factor Analysis of Barry Fraser's Model

Fraser (1990) constructed his models, based on the Five-Factor Correlated model. The Five- correlated factors were Personalisation (CCAPER/CCPPER), Participation (CCAPAR/CCPPAR), Independence (CCAINP/CCPINP), Investigation (CCAINV/CCPINV), and Differentiation. (CCADFR/CCPDFR). The CFA was carried out for both components of the instrument, the actual (CCA) and the preferred (CCP) classroom environment.

The CFA results are presented in terms of the factor loadings of the variables tested and model fit indices. Hair et al. (2010, p. 117) suggested that 'factor loadings greater than $\pm$ 0.30 to $\pm$0.40 are considered to meet the minimal level for interpretation of structure. Loadings $\pm$ 0.50 or greater are considered practically significant. Loadings exceeding 0.70 are considered indicative of well-defined structure and are the goal of any factor analysis'. In summary, a factor loading greater than 0.40 indicates that the constructs tested do measure the latent variables.

To confirm the fit of the models at the student level, a number of indices discussed on pages 128-129, were used. These values indicated how well the models tested are fitted the sample data. The factor structures of the Five-Factor correlated models for both CCA and CCP are presented in Figure 5.1, followed by the factor loadings for the actual and preferred classroom in Table 5.4.

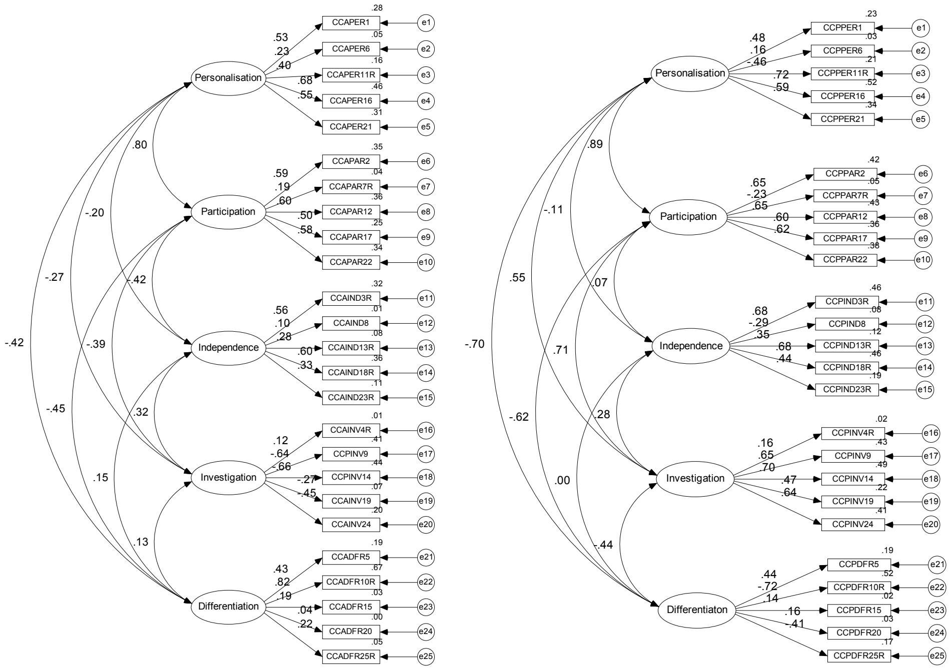

Figure 5. 1 Five-Factor Correlated Model of CCA and CCP

Table 5. 4 Factor Loadings of Five-Factor Correlated Model for CCA and CCP

Item	**PERSONALISATION**		**PATICIPATION**		**INDEPENDENCE**		**INVESTIGATION**		**DIFFERENTIATION**	
	CCA	**CCP**	**CCA**	**CCP**	**CCA**	**CCP**	**CCA**	**CCP**	**CCA**	**CCP**
PER1	0.53	0.48								
PER6	0.23	0.16								
PER11R	0.40	-0.46								
PER16	0.68	0.72								
PER21	0.55	0.59								
PAR2			0.59	0.65						
PAR7R			0.19	-0.23						
PAR12			0.60	0.65						
PAR17			0.50	0.60						
PAR22			0.58	0.62						
IND3R					0.56	0.68				
IND8					0.10	-0.29				
IND13R					0.28	0.35				
IND18R					0.60	0.68				
IND23R					0.33	0.44				
INV4R							0.12	0.16		
INV9							-0.64	0.65		
INV14							-0.66	0.70		
INV19							-0.27	0.47		
INV24							-0.45	0.64		
DFR5									0.43	0.44
DFR10R									0.82	-0.72
DFR15									0.19	0.14
DFR20									0.04	0.16
DFR25R									0.22	-0.41

The results showed that most of the factor loadings for the Five-Factor correlated model of CCA were moderate. All of the five dimensions in ICEQ instrument had positive loadings except for the investigation dimension, which showed a negative loading. There were four variables that had negative values CCAINV9 (-0.64), CCAINV14 (-0.66), CCAINV19 (-0.27) and CCAINV24 (-0.45). However, most of the absolute values were more then 0.30, except for CCAINV19 (-0.27). Furthermore, out of 25 items, 7 items; namely CCAPER6 (0.23), CCAPAR7R (0.17), CCAIND8 (0.10), CCAIND13R (0.28), CCADFR20 (0.04), had factor loadings less than 0.30. These factor loadings indicate that the items did not reflect the latent variables well. Similar results were apparent in the actual correlation between each scale in actual classroom components.

Factor loadings for CCP, as presented in Table 5.4, ranged from -0.72 to 0.72 which indicated strong loadings. There were a few items that had negative factor loadings CCPER11R (-0.46), CCPPAR7R (-0.23), CCPIND8 (-0.29), CCPDFR10R (-0.72) and CCPDFR25R (-0.41). Most of these items had an absolute factor loading of more than 0.30 except for CCPPAR7R (-0.23) and CCPIND8 (-0.29). In addition, there were four items that had factor loadings of less than 0.30. These items were CCPINV4R (0.16), CCPDFR15 (0.14) and CCPDFR20 (0.16). From these results it can be argued that both components in the ICEQ instrument (actual classroom and preferred classroom) were not fitting the sample data well, although in general items in the CCP component showed stronger factor loadings. Some items also revealed conflicting results. While PER11R had a positive loading for CCA, it had a negative loading for CCP. Similar results were also found for PAR7R, IND8, DRF10R and DRF25R. These flips between negative and positive indicate inconsistency in students' responses for these items. For these reasons, a few items were removed from both components, CCA and CCP; namely PER11R (CCA 0.40, CCP -0.46), PAR7R (CCA 0.19, CCP -0.23), IND8 (CCA 0.10, CCP -0.29), INV4R (CCA 0.12, CCP 0.16), DRF10R (CCA 0.82, CCP -0.72) and DRF25R (CCA 0.22, CCP -0.41). Furthermore, four models for each component were proposed for testing as alternative models in this study.

Table 5. 5 Fit Indices for the Five - Factor Correlated Models of ICEQ

INDICES	Five-Factor Correlated (CCA)	Five-Factor Correlated (CCP)
Chi –Square (x^2)	2365.43	2325.54
Degree of Freedom (df)	265	265
$\frac{x^2}{df}$	8.93	8.78
Tucker-Lewis Index (TLI)	0.57	0.70
Comparative Fit Index (CFI)	0.65	0.75
Root Mean Square Error of Approximation (RMSEA)	0.07	0.07

Both models showed high chi-square values. However, this indicator is sensitive to the sample size (Diamantoplous & Siguaw, 2000).The other alternative indicator used was the $\frac{x^2}{df} < 5$. The results showed that the values of the $\frac{x^2}{df}$ for CCA (8.93) and CCP (8.78) were greater than 5. The results indicated that these models did not fit the data well. Then TLI, CFI values and RMSEA were used to evaluate the goodness-of-model fit. The RMSEA value for both components CCA and CCP in the ICEQ instrument was 0.07. This result indicated a reasonable fit, based on the indicator suggested by Diamantoplous and Siguaw, (2000). In addition, the values of TLI and CFI were below 0.90 for both models. Based on the fit indices discussed above, these models needed to be improved. Therefore, four alternative models were proposed for testing in this study.

Confirmatory Factor Analysis of the Alternative Models

Four additional models were tested as alternative models, using AMOS (Version 17). These were; a) One Factor Model, (b) Five Factor Orthogonal Model, (c) Five Factor Correlated Model and, (d) Five Factor Hierarchical Model (see Figures 5.2 for CCA and 5.3 for CCP). These models were tested due to the poor factor loadings and low fit indices of the initial models.

Table 5. 6 Researcher's New Structure Factor for CCA (Actual Classroom Environment)

Author Factor	Old Order	Researcher Factor	New Order	Classification
PER	CCAPER1	**PER**	CCAPER1	
	CCAPER6		CCAPER6	
	CCAPER11R		**CCAPER11R**	**Removed**
	CCAPER16		CCAPER16	
	CCAPER21		CCAPER21	
PAR	CCAPAR2	**PAR**	CCAPAR2	
	CCAPAR7R		**CCAPAR7R**	**Removed**
	CCAPAR12		CCAPAR12	
	CCAPAR17		CCAPAR17	
	CCAPAR22		CCAPAR22	
IND	CCAIND3R	**IND**	CCAIND3R	
	CCAIND8		**CCAIND8**	**Removed**
	CCAIND13R		CCAIND13R	
	CCAIND18R		CCAIND18R	
	CCAIND23R		CCAIND23R	
INV	CCAINV4R	**INV**	**CCAINV4R**	**Removed**
	CCAINV9		CCAINV9	
	CCAINV14		CCAINV14	
	CCAINV19		CCAINV19	
	CCAINV24		CCAINV24	
DFR	CCADFR5	**DFR**	CCADFR5	
	CCADFR10R		**CCADFR10R**	**Removed**
	CCADFR15		CCADFR15	
	CCADFR20		CCADFR20	
	CCADFR25R		**CCADFR25R**	**Removed**

The new structure for the alternative models is presented in Tables 5.6 and 5.7 which show that the five scales were retained, but a few items were removed, namely PER11R, PAR7R, IND8, INV4R, DRF10R and DRF25R. The factor loadings of the alternative models are presented in Table 5.8 and the factor structures for both components are presented in Figures 5.2 and 5.3.

Table 5. 7 Researcher's New Structure for CCP (Preferred Classroom Environment)

Author Factor	Old Order	Researcher Factor	New Order	Classification
PER	**CCPPER1**	**PER**	CCPPER1	
	CCPPER6		CCPPER6	
	CCPPER11R		**CCPPER11R**	**Removed**
	CCPPER16		CCPPER16	
	CCPPER21		CCPPER21	
PAR	**CCPPAR2**	**PAR**	CCPPAR2	
	CCPPAR7R		**CCPPAR7R**	**Removed**
	CCPPAR12		CCPPAR12	
	CCPPAR17		CCPPAR17	
	CCPPAR22		CCPPAR22	
IND	**CCPIND3R**	**IND**	CCPIND3R	
	CCPIND8		**CCPIND8**	**Removed**
	CCPIND13R		CCPIND13R	
	CCPIND18R		CCPIND18R	
	CCPIND23R		CCPIND23R	
INV	**CCPINV4R**	**INV**	**CCPINV4R**	**Removed**
	CCPINV9		CCPINV9	
	CCPINV14		CCPINV14	
	CCPINV19		CCPINV19	
	CCPINV24		CCPINV24	
DFR	**CCPDFR5**	**DFR**	CCPDFR5	
	CCPDFR10R		**CCPDFR10R**	**Removed**
	CCPDFR15		CCPDFR15	
	CCPDFR20		CCPDFR20	
	CCPDFR25R		**CCPDFR25R**	**Removed**

Table 5. 8 Factor Loadings of the Alternative Models - CCA and CCP

			CCA							CCP			
Items	**One Factor Model**		**Items**	**Five-Factor Orthogonal Model**	**Five-Factor Correlated Model**	**Five-Factor Hierarchical Model**	**Items**	**One Factor Model**		**Items**	**Five-Factor Orthogonal Model**	**Five-Factor Correlated Model**	**Five-Factor Hierarchical Model**
	Loadings			Loadings	Loadings	Loadings		Loadings			Loadings	Loadings	Loadings
CCPPER1	0.47	**PER**	CCPPER1	0.54	0.48	0.55	CCPPER1	0.50	**PER**	CCPPER1	0.44	0.50	0.52
CCPPAR2	0.55		CCPPER6	0.27	0.38	0.29	CCPPER6	0.64		CCPPER6	0.20	0.20	0.24
CCPDFR5	-0.05		CCPPER16	0.66	0.63	0.63	CCPPER16	-0.14		CCPPER16	0.72	0.70	0.67
CCPPER6	0.30		CCPPER21	0.53	0.54	0.53	CCPPER21	0.25		CCPPER21	0.61	0.57	0.56
CCPINV9	0.45	**PAR**	CCPPAR2	0.63	0.59	0.61	CCPPAR2	0.53	**PAR**	CCPPAR2	0.70	0.66	0.67
CCPPAR12	0.56		CCPPAR12	0.63	0.61	0.61	CCPPAR12	0.62		CCPPAR12	0.70	0.65	0.66
CCPINV14	0.49		CCPPAR17	0.52	0.50	0.49	CCPPAR17	0.57		CCPPAR17	0.56	0.59	0.59
CCPDFR15	0.12		CCPPAR22	0.50	0.58	0.57	CCPPAR22	0.14		CCPPAR22	0.55	0.61	0.61
CCPPER16	0.51	**IND**	CCPIND3R	0.60	0.56	0.57	CCPIND3R	0.59	**IND**	CCPIND3R	0.69	0.67	0.67
CCPPAR17	0.43		CCPIND13R	0.24	0.29	0.30	CCPIND13R	0.56		CCPIND13R	0.36	0.35	0.37
CCPINV19	0.35		CCPIND18R	0.57	0.57	0.56	CCPIND18R	0.44		CCPIND18R	0.66	0.66	0.65
CCPDFR20	0.18		CCPIND23R	0.34	0.35	0.34	CCPIND23R	0.05		CCPIND23R	0.45	0.46	0.46
CCPPER21	0.45	**INV**	CCPINV9	0.64	0.64	0.62	CCPINV9	0.50	**INV**	CCPINV9	0.68	0.66	0.67
CCPPAR22	0.56		CCPINV14	0.69	0.66	0.67	CCPINV14	0.61		CCPINV14	0.71	0.70	0.70
CCPINV24	0.48		CCPINV19	0.31	0.28	0.35	CCPINV19	0.65		CCPINV19	0.42	0.47	0.45
CCPIND3R	-0.30		CCPINV24	0.58	0.45	0.60	CCPINV24	0.11		CCPINV24	0.64	0.65	0.65
CCPIND13R	-0.30	**DFR**	CCPDFR5	0.48	0.47	0.41	CCPDFR5	0.20	**DFR**	CCPDFR5	0.53	0.50	0.55
CCPIND18	-0.32		CCPDFR15	0.62	0.58	0.72	CCPDFR15	0.13		CCPDFR15	0.57	0.51	0.55
CCPIND23R	-0.20		CCPDFR20	0.26	0.32	0.25	CCPDFR20	0.23		CCPDFR20	0.46	0.54	0.45

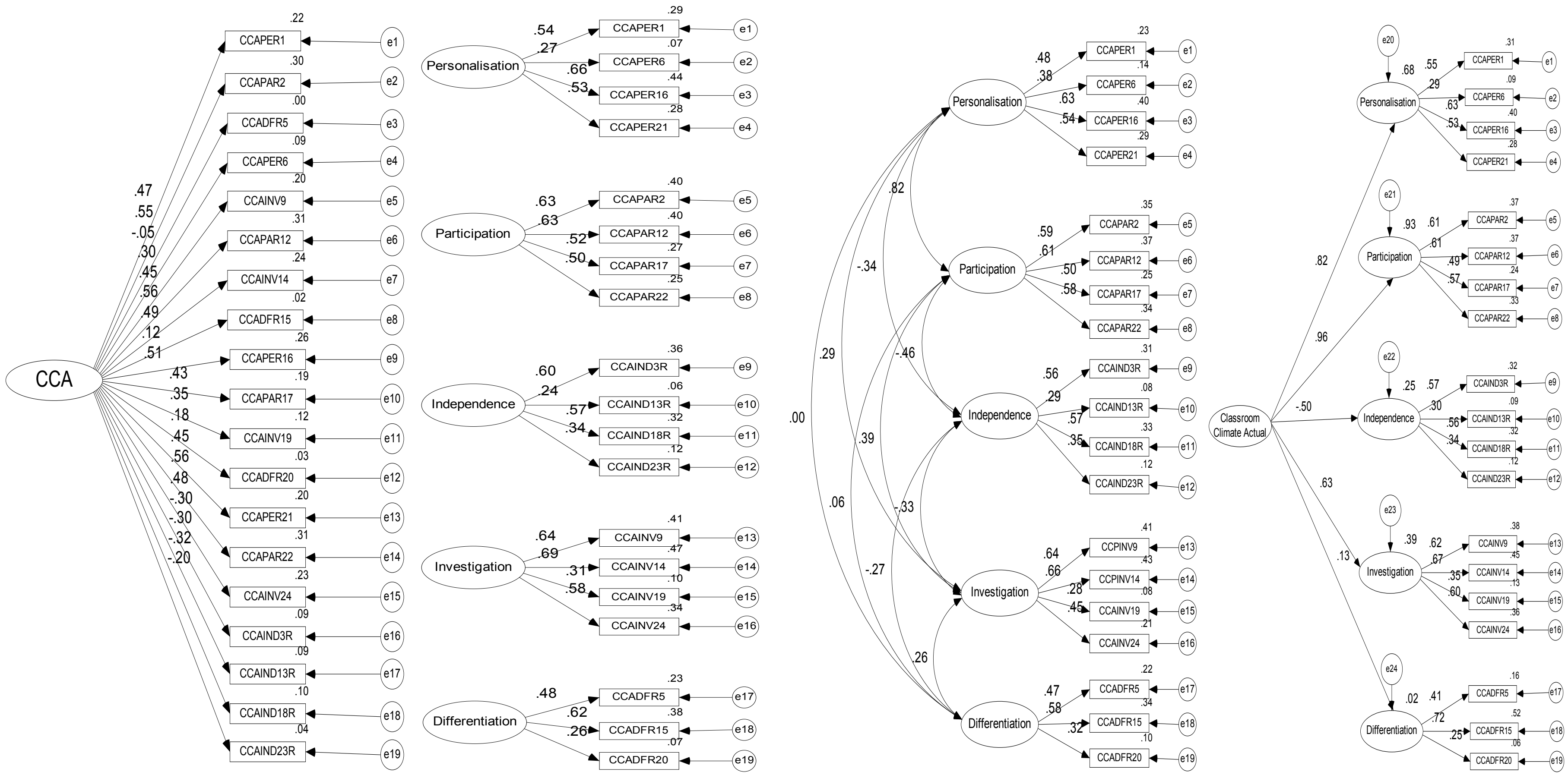

Figure 5. 2 (a) One Factor (b) Five Factor Orthogonal (c) Five Factor Correlated (d) Five Factor Hierarchical Models of CCA

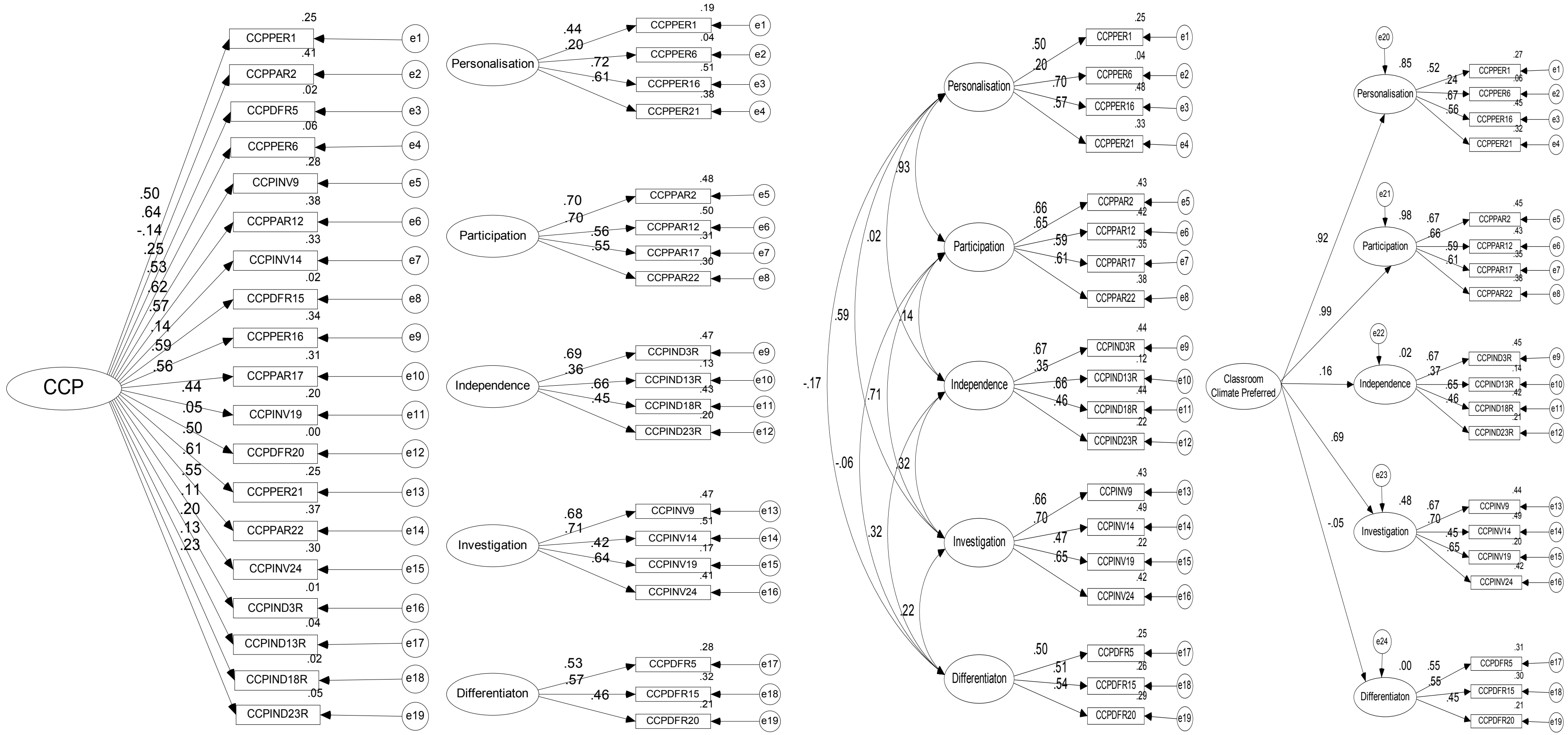

Figure 5. 3 (a) One Factor (b) Five Factor Orthogonal (c) Five Factor Correlated Models (d) Five Factor Hierarchical Models of CCP

Factor loadings of the four models, namely the One Factor Model, the Five Factor Orthogonal Model, the Five Factor Correlated Model and the Five Factor Hierarchical Model for CCA are presented in Table 5.8. The factor loadings ranged from - 0.05 to 0.72 for CCA, as well as for CCP also ranged from 0.05 to 0.72. The factor loadings in all models showed improvement compared to the Fraser's models. In particular, CCP Five-Factor Correlated model and Five-Factor Hierarchical Model showed satisfactory patterns of factor loadings, indicating that most of the items reflected the constructs adequately. In summary these models to some extent, were better than the initial models.

Table 5. 9 Fit Indices for the Alternative Models

Models/Indices	One Factor		Five Factor Orthogonal		Five Factor Correlated		Five Factor Hierarchical	
	CCA	CCP	CCA	CCP	CCA	CCP	CCA	CCP
Chi –Square (x^2)	1845.66	2525.96	2098.42	2610.98	1242.84	1082.29	1113.02	1274.34
Degree of Freedom (df)	152	152	152	152	143	142	147	148
$\frac{x^2}{df}$	12.14	16.61	13.80	17.17	8.69	7.62	7.57	8.62
Tucker-Lewis Index (TLI)	0.55	0.53	0.48	0.52	0.67	0.80	0.73	0.77
Comparative Fit Index (CFI)	0.64	0.63	0.58	0.61	0.75	0.85	0.79	0.82
Root Mean Square Error of Approximation (RMSEA)	0.08	0.09	0.08	0.99	0.06	0.06	0.06	0.06

The Five Factor Correlated and Five Factor Hierarchical Models showed better fits to the data compared to the One Factor and Five Factor Orthogonal Models. Table 6.9 presents the values of the fit indices for the four alternative models, namely (a) One Factor Model, (b) Five Factor Orthogonal Model, (c) Five Factor Correlated Model and, (d) Five Factor Hierarchical Model. The Chi-square to the numbers of degree of freedom

($\frac{x^2}{df}$) for the alternative models of CCA and CCP ranged from 7.57 to 16.6. The values for the alternative Five Factor Correlated Model for both CCA and CCP were slightly better than the author's model. A similar pattern was also found in the values of CFI and TLI for the two models. The values of these fit indices for the alternative Five Factor Correlated model were better than the Frasers' model. When a comparison was made between two alternative models for the best fit to data, the Five Factor Correlated Model and the Five Factor Hierarchical Model were chosen. The results showed some inconsistencies, for CCA, the Five Factor Correlated Model was found to fit the data better. However, for the CCP the Five Factor Hierarchical Model was found to fit the data better. Therefore, for the purpose of further analysis, the Five Factor Hierarchical Model was chosen for use on subsequent analyses.

5.4 The Learning Process Questionnaire (LAHC)

The Learning Process Questionnaires (LPQ) was developed by Biggs (1987) to measure students' learning processes. There were two forms of questionnaires which measured students' learning processes: (a) the Learning Process Questionnaire (LPQ) and (b) the Study Process Questionnaire (SPQ). The SPQ was similar to the LPQ except that the SPQ focused on tertiary students and had more items compared to the LPQ instruments. In this study, the samples were students in secondary schools rather than those in tertiary educations and for that reason, the LPQ was used instead of the SPQ. For the purpose of this study the instrument was labelled as LAHC.

The LPQ instrument consisted of 36 items measuring students' specific learning approaches. There were three approaches to learning: Deep Approach (DA), Surface Approach (SA) and Achieving Approach (AA). Each scale had two subscales: Motive and

Strategy. All the items used a five-point Likert-scale with responses ranging from 1. Strongly Disagree 2. Disagree 3. No Opinion 4. Agree to 5. Strongly Agree.

According to Biggs (1987), the LPQ was tested for reliability and validity in Australia in 1979 using one sample of Australian students aged 14 and another sample of year 11 students. Test-retest reliability was carried out for year 11 students in two independent studies; the values ranging from 0.49 to 0.72 in one study and from 0.60 to 0.70 in the other study. These results indicated that the items had satisfactory reliability. As for the internal consistency of the LPQ, the alpha coefficients ranged from 0.46 to 0.77 for students aged 14 and from 0.45 to 0.78 for year 11 students. Biggs (1987, p.37) indicated that these findings were very satisfactory. The following sections discuss the LPQ instrument validation using the CFA procedure in details.

5.5. Instrument Structure Analysis

CFA modeling was carried out to determine the structure of the instrument that measured student learning processes in this study. The analysis was based on the sample data from 1653 Form Four secondary school students in Kuala Lumpur, Malaysia. AMOS 17 was used to carry out the CFA and to draw the factor structure in this analysis. The result of the CFA was presented in terms of factor loadings and the model fit, based on the values of RMSEA, TLI, and CFI. The results of these values are discussed in the following sections.

Confirmatory Factor Analysis of Biggs Model

CFA analysis was carried out in the validation of the LPQ instrument. A Six Orthogonal Factor model was tested to examine how well the observed variables measured the latent variables in this instrument. This model is presented in Figure 5.4 followed by a summary of factor loadings in Table 5.10, and the model fit indices in Table 5.11.

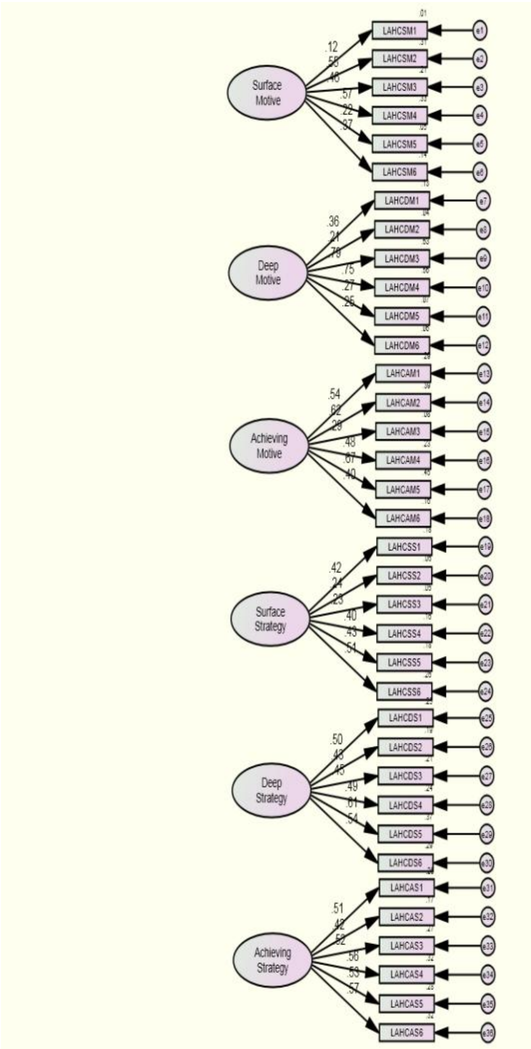

Figure 5. 4 Six- Orthogonal Factor Model

Table 5. 10 Factor Loadings for Six-Orthogonal Factor Model

Items	Factor Loadings
LAHCSM1	**0.12**
LAHCSM2	0.55
LAHCSM3	0.46
LAHCSM4	0.57
LAHCSM5	0.22
LAHCSM6	0.37
LAHCDM1	**0.36**
LAHCDM2	0.21
LAHCDM3	0.79
LAHCDM4	0.75
LAHCDM5	0.27
LAHCDM6	0.25
LAHCAM1	**0.54**
LAHCAM2	0.62
LAHCAM3	0.29
LAHCAM4	0.48
LAHCAM5	0.67
LAHCAM6	0.40
LAHCSS1	**0.42**
LAHCSS2	0.24
LAHCSS3	0.23
LAHCSS4	0.40
LAHCSS5	0.43
LAHCSS6	0.51
LAHCDS1	**0.50**
LAHCDS2	0.43
LAHCDS3	0.45
LAHCDS4	0.49
LAHCDS5	0.61
LAHCDS6	0.54
LAHCAS1	**0.51**
LAHCAS2	0.42
LAHCAS3	0.52
LAHCAS4	0.56
LAHCAS5	0.53
LAHCAS6	0.57

The factor loadings on the six dimensions of LPQ instrument presented in Table 5.10 ranged from 0.12 to 0.79. Seven items were found to have loadings less that 0.30 which indicated a poor fit to the data. These items were LAHCSM (0.12), LAHCSM5 (0.22),

LAHCDM2 (0.21), LAHCDM5 (0.27), LAHCDM6 (0.25), LAHCAM3 (0.29), LAHCSS2 (0.24) and LAHCSS3 (0.23). However, the rest of the items showed moderate factor loadings.

Table 5. 11 Fit Indices for the Six- Orthogonal Factor Models

INDICES	Six-Factor LACH/LPQ
Chi –Square (x^2)	6680.83
Degree of Freedom (df)	594
$\frac{x^2}{df}$	11.2
Tucker-Lewis Index (TLI)	0.41
Comparative Fit Index (CFI)	0.48
Root Mean Square Error of Approximation (RMSEA)	0.08

Diamantoplous and Siguaw (2000) claimed that a value of RMSEA less than 0.05 is accepted as indicating a good fit, values between 0.05 and under 0.08 a reasonable fit, values between 0.08 and under 0.10 a mediocre fit and values under 0.10 a poor fit. Based on this claim, it was found that this model demonstrated a mediocre fit to the sample data because the RMSEA values of the Six-Factor Model was 0.08. Moreover, the TLI and CLI for both models were less than 0.90. These results indicate that the model had room for improvement. Consequently, further testing was carried out using alternative models. The results are reported in the following section.

Confirmatory Factor Analysis of the Alternative Model

Four alternative models were tested and compared, to identify which would adequately fit the sample data. The four models were (a) Six-Factor Correlated Model, (b) Six Factor Hierarchical Order Model (c) Six Factor Hierarchical Second Model and, (d) Six Factor Hierarchical Third Order Model (see Figure 5.5). Furthermore, CFA was carried out to confirm whether the observed variables were measuring the latent variables which they were represented to measure in the instrument. The variables are presented in Figure 5.5, followed by the factor loadings of the LAHC in Table 5.12 and the model fit indices in Table 5.13.

Table 5. 12 Factor loadings of items in Six-Factor Correlated Model, Hierarchical Model Second Order and Hierarchical Model Third Order

Variables	Subscale	Six-Factor Correlated Model	Hierarchical Model	Variables	Scale	Subscale	Hierarchical Second Order Model	Hierarchical Third Order Model
LAHCSM1	**Surface Motive**	0.11	0.04	**LAHCSM1**		**Surface Motive**	0.33	0.11
LAHCSM2		0.45	0.48	LAHCSM2			0.48	0.44
LAHCSM3		0.57	0.58	LAHCSM3			0.54	0.55
LAHCSM4		0.48	0.52	LAHCSM4			0.52	0.48
LAHCSM5		0.24	0.18	LAHCSM5			0.26	0.27
LAHCSM6		0.43	0.39	LAHCSM6	**Surface**		0.45	0.45
LAHCDM1	**Deep Motive**	0.43	0.44	**LAHCSS1**		**Surface Strategy**	0.29	0.42
LAHCDM2		0.28	0.28	LAHCSS2			0.50	0.27
LAHCDM3		0.70	0.69	LAHCSS3			0.48	0.25
LAHCDM4		0.70	0.69	LAHCSS4			0.14	0.37
LAHCDM5		0.35	0.35	LAHCSS5			0.38	0.43
LAHCDM6		0.37	0.38	LAHCSS6			0.28	0.50
LAHCAM1	**Achieving Motive**	0.52	0.50	**LAHCDM1**		**Deep Motive**	0.45	0.44
LAHCAM2		0.68	0.70	LAHCDM2			0.26	0.26
LAHCAM3		0.26	0.28	LAHCDM3			0.70	0.70
LAHCAM4		0.48	0.47	LAHCDM4			0.71	0.72
LAHCAM5		0.63	0.63	LAHCDM5			0.34	0.34
LAHCAM6		0.39	0.38	LAHCDM6	**Deep**		0.36	0.35
LAHCSS1	**Surface Strategy**	0.47	0.44	**LAHCDS1**		**Deep Strategy**	0.45	0.46
LAHCSS2		0.23	0.21	LAHCDS2			0.47	0.47
LAHCSS3		0.19	0.20	LAHCDS3			0.50	0.50
LAHCSS4		0.37	0.41	LAHCDS4			0.46	0.46
LAHCSS5		0.41	0.41	LAHCDS5			0.63	0.63
LAHCSS6		0.53	0.52	LAHCDS6			0.49	0.49
LAHCDS1	**Deep Strategy**	0.46	0.47	**LAHCAM1**		**Achieving Motive**	0.50	0.51
LAHCDS2		0.45	0.47	LAHCAM2			0.69	0.69
LAHCDS3		0.49	0.52	LAHCAM3			0.28	0.27
LAHCDS4		0.47	0.46	LAHCAM4			0.48	0.47
LAHCDS5		0.64	0.61	LAHCAM5			0.62	0.63
LAHCDS6		0.50	0.49	LAHCAM6	**Achieving**		0.39	0.39
LAHCAS1	**Achieving Strategy**	0.50	0.50	**LAHCAS1**		**Achieving Strategy**	0.51	0.49
LAHCAS2		0.45	0.45	LAHCAS2			0.45	0.46
LAHCAS3		0.49	0.49	LAHCAS3			0.49	0.49
LAHCAS4		0.53	0.52	LAHCAS4			0.53	0.51
LAHCAS5		0.55	0.56	LAHCAS5			0.55	0.56
LAHCAS6		0.59	0.59	LAHCAS6			0.59	0.59

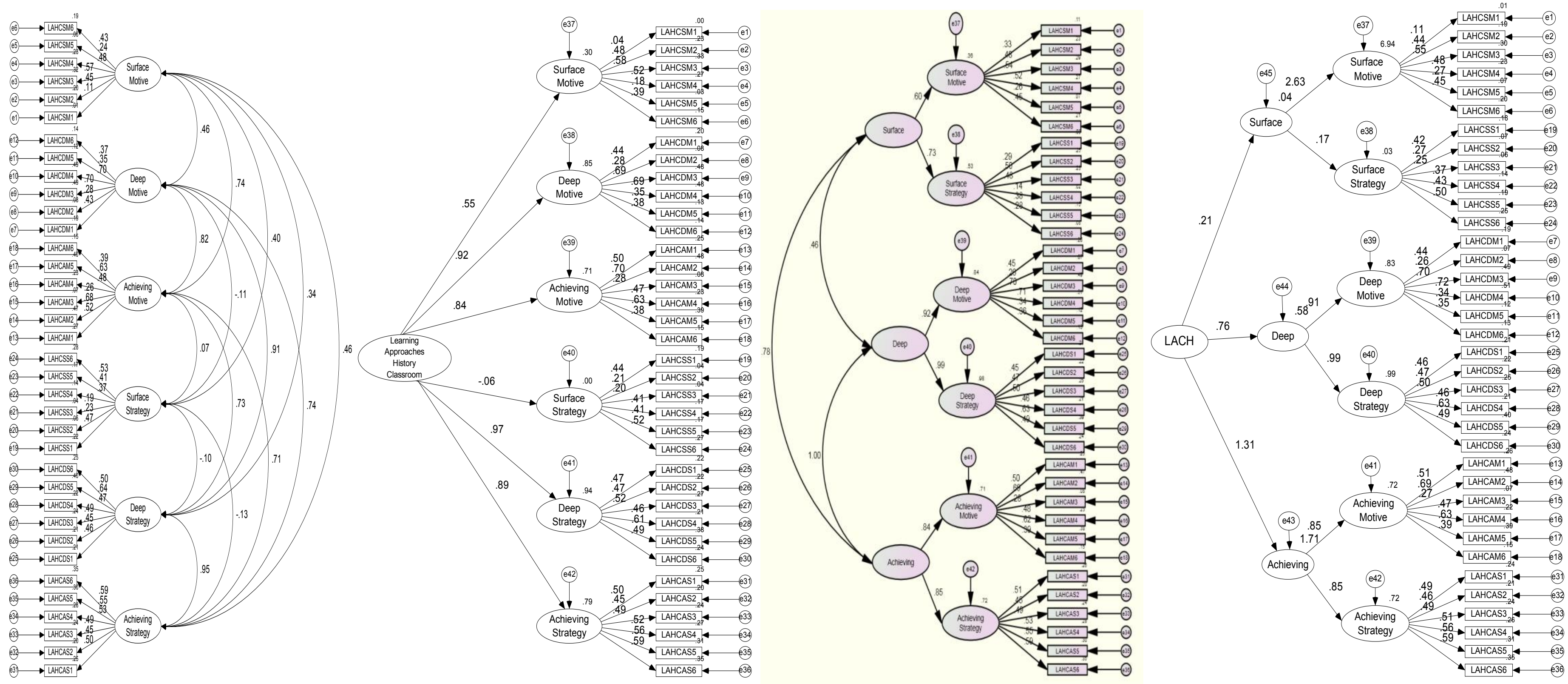

Figure 5. 5 (a) Six Factor Correlated (b) Six Factor Hierarchical (c) Six Factor Hierarchical Second Order d) Six Factor Hierarchical Third Order Models of LAC

Table 5.13 indicates that all the items had positive loadings, although there were four items in Six-Factor Correlated Model, three items in Hierarchical Third Order Model and four items in Hierarchical Second Order Model, which had factor loadings lower than 0.30. Hair et al., (2010, p. 117) recommended that 'factor loadings in the range of $\pm$ 0.30 to $\pm$0.40 are considered to meet the minimal level: for interpretation of structure. Loadings $\pm$ 0.50 or greater are considered practically significant. Loadings exceeding 0.70 are considered indicative of well-defined structure and are the goal of any factor analyses. Overall in these four models, the range of factor loadings was from 0.04 to 0.71 which indicated a moderate fit.

The Hierarchical Model and the Six-Factor Correlated had six items with factor loadings less than 0.30. However, the rest of the items ranged from 0.40 to 0.70, with two having a high value of 0.70. In summary, these models showed improved loadings compared to the Biggs's model. The results of the Hierarchical Third order and Second Order Models were even better and much better than the Biggs's model. Out of 36 items, 33 items of the Hierarchical Third Order Model had a minimum value of 0.30 factor loading. Furthermore, all the items had positive loadings. Similar results were evident in the Second Order Model, which had only three items below the 0.30 loadings. The remaining items ranged from more than 0.30 to 0.71. None of the items had negative loadings. These result indicated that both of these models did fit the data sample well.

Table 5. 13 Fit Indices for the Six-Factor Models

INDICES	Six-Factor Correlated	Hierarchical Model	Hierarchical Second Order	Hierarchical Third Order
Chi –Square (x^2)	3571.50	3986.35	3949.91	3774.282
Degree of Freedom (df) $\frac{x^2}{df}$	(579) 6.17	(588) 6.78	(589) 6.71	(585) 6.45
Tucker-Lewis Index (TLI)	0.70	0.66	0.67	0.68
Comparative Fit Index (CFI)	0.74	0.70	0.71	0.72
Root Mean Square Error of Approximation (RMSEA)	0.06	0.06	0.06	0.06

The fit indices based on the AMOS program (Arbuckle, 1999) for the last four alternative models are presented in Table 5.14. The value of chi-square divided by the degree of freedom ($\frac{x^2}{df}$) of the alternative models ranged from 6.17 - 6.71. This result indicated that the models were close to the critical value of 5. The RMSEA is another indicator used to describe the model fit. The RMSEA value shows 'how well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available' (Diamantoplous & Siguaw, 2000, p. 85). The RMSEA values of all four models showed an identical result (0.06), which indicated that the models had a reasonable fit. On the order hand, the values of TLI and CFI values were less than 0.90, which indicated a moderate fit to the models. As a consequence of these results, the Six Factor Hierarchical Second Order Model was used for the PLSPATH analysis.

5.6 The Students' Perception of History Questionnaire (SPERCH)

This instrument of 10 items was designed to measure the students' perceptions of History learning objectives in the classroom. This instrument was developed by the researcher, and was grounded on the History Learning Objectives stated in the Malaysian History syllabus (Ministry of Education, Malaysia, 2002). There were three subscales in the instrument namely country, community and individual. Each item response used a five-point Likert scale: 1. Strongly Disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly Agree. The internal consistency value for this instrument was 0.88.

5.7 Instrument Structure Analysis

An Exploratory Factor Analysis (EFA) was carried out to examine the factorial structure of this newly developed instrument. In addition, Confirmatory Factor Analysis (CFA) was performed to validate the SPERCH instrument. According to Curtis (2005, p. 183), EFA is used to show that 'the patterns of response to the items of the instrument reflect the constructs that were used in framing the instrument'. In this study, EFA was employed using principal components extraction, followed by varimax rotation, using SPSS version 17.

Table 5. 14 Rotated factor solution for an exploratory analysis of the SPERCH (New Structure)

Item no.	Sub-scale	Factor 1	Factor 2	Factor 3
SPERCH1	Country	0.69		
SPERCH2		0.78		
SPERCH3		0.68		
SPERCH4		0.54		
SPERCH5	Community		0.72	
SPERCH6			0.79	
SPERCH7			0.65	
SPERCH8	Individual			0.70
SPERCH9				0.82
SPERCH10				0.62

Factor loadings for the SPERCH instruments are presented in Table 5.15. The factor loadings range from 0.54 to 0.79 which indicates that the items the best indicators for these factors. Therefore, no items were removed from the instruments. Although EFA showed that most of the items reflected the construct and showed coverage of the items, according to Curtis (2005, p. 185) EFA fails to show whether the constructs form a certain concept. Due to these limitations, CFA was carried further in this study, to determine the structure of the constructs and to test the model fit. As alternatives models, four models were tested namely; (a) One Factor Model (b) Three Factor Orthogonal Model (c) Three factor Correlated Model and (d) Three Factor Hierarchical Model.

Confirmatory Factor Analysis for the Alternative Model

As a first step, the One-Factor Model was tested in CFA to determine the model fit. CFA examines how well the observed variables reflect the latent variables which they are represented to measure in the instrument. This model consisted of 10 items. Model fit and factor loadings are discussed in this analysis. The results are presented in Table 5.16.

The factor structure is presented in Figure 5.7. Most of the loadings have been above 0.50, which indicated that the items were strongly correlated. Overall, the items had strong factor loadings onto the latent factors. However it was considered necessary to test alternative models such as, Three-Factor Correlated and Three-Factor Hierarchical Models in further analysis.

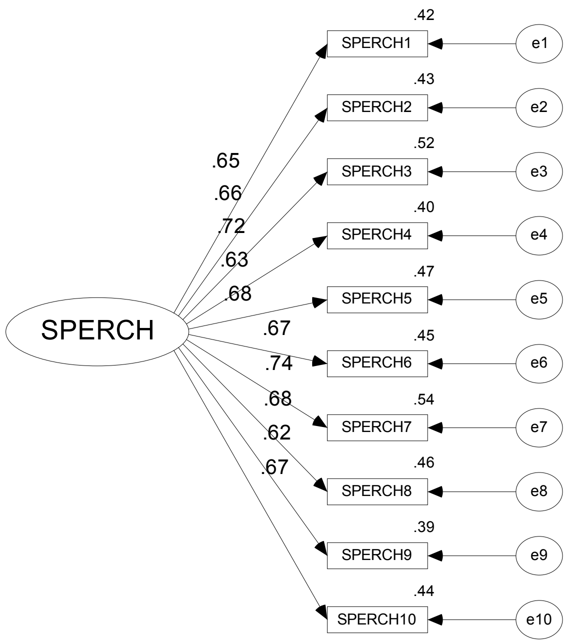

Figure 5. 6 One - Factor Model

Table 5. 15 Factor loadings of the SPERCH

Item no.	Factor Loadings
SPERCH1	0.65
SPERCH2	0.66
SPERCH3	0.72
SPERCH4	0.63
SPERCH5	0.68
SPERCH6	0.67
SPERCH7	0.74
SPERCH8	0.68
SPERCH9	0.62
SPERCH10	0.67

Table 5. 16 Fit Indices for the One-Factor Model

INDICES	One-Factor Model SPERCH
Chi –Square (x^2)	543.94
Degree of Freedom (df)	35
$\frac{x^2}{df}$	15.54
Tucker-Lewis Index (TLI)	0.88
Comparative Fit Index (CFI)	0.92
Root Mean Square Error of Approximation (RMSEA)	0.09

The fit indices for the One-Factor Initial Model are presented in Table 5.16. The values of TLI (0.88) and CFI (0.92) were reasonable. Furthermore, the RMSEA value of 0.09 indicated that the model had a mediocre fit. Based on the fit indices given in Table 5.16 this model can be improved. Therefore, further analysis was carried out with the alternative models to identify which alternative structures had the best fit indices.

The three alternative models were tested using AMOS (Version 17) namely; (a) Three Factor Orthogonal Model, (b) Three Factor Correlated Model and, (c) Three Factor Hierarchical Model (see Figure 5.7). Based on EFA there were three subscales in SPERCH, namely a) country, b) community, and c) individual. The instrument consisted of 10 items. The Country subscale had 3 items, the Community subscale had 4 items and the Individual subscale had 3 items. The results of the CFA procedure are displayed in terms of factor loadings (see Table 5.17) and fit indices (see Table 5.18). AMOS was used to carry out CFA and to draw the diagram, presented in Figure 5.7.

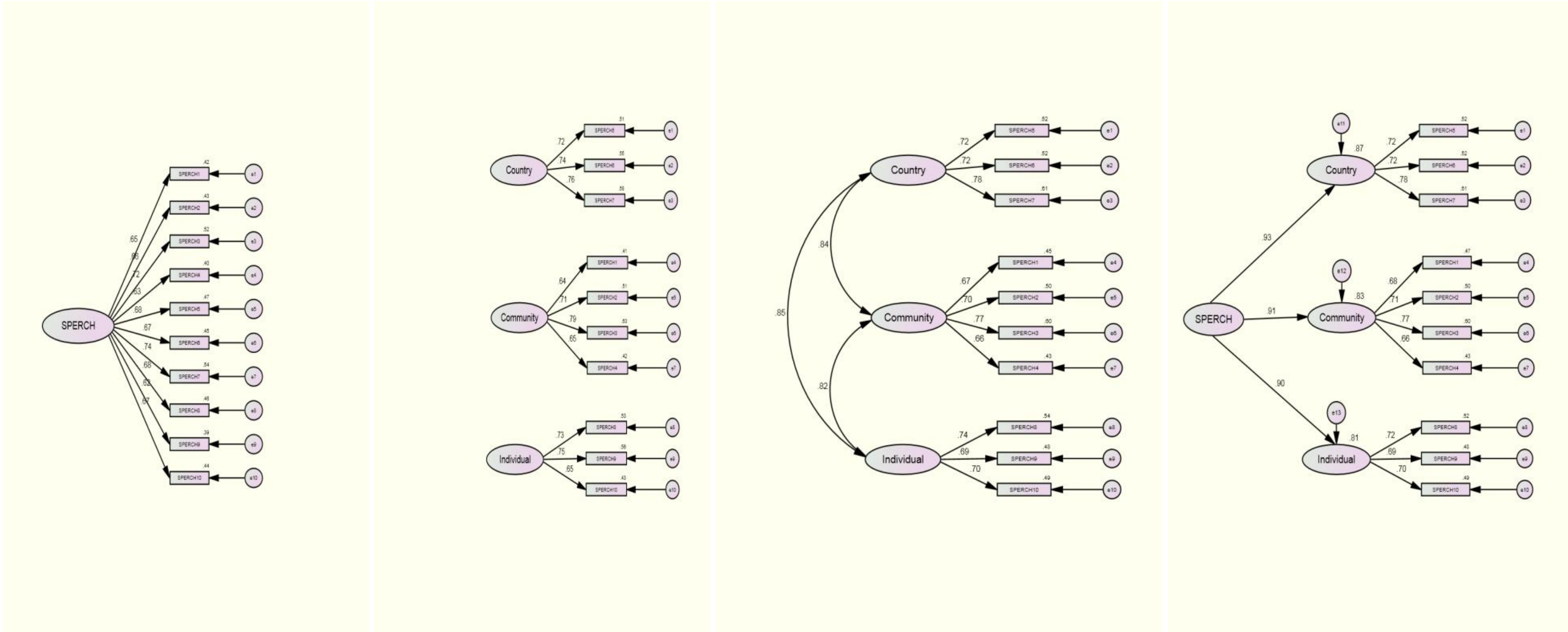

Figure 5. 7 (a) One Factor (b) Three Factor Orthogonal (c) Three Factor Correlated (d) Three Factor Hierarchical Models of SPER

Table 5. 17 Factor Loading of the Alternative Models

Item no.	Sub-scale	Three-Factor Orthogonal SPERCH	Three-Factor Correlated SPERCH	Three-Factor Hierarchical SPERCH
SPERCH5	Country	0.72	0.72	0.72
SPERCH6		0.74	0.72	0.72
SPERCH7		0.76	0.78	0.78
SPERCH1	Community	0.64	0.68	0.68
SPERCH2		0.71	0.71	0.71
SPERCH3		0.79	0.77	0.77
SPERCH4		0.65	0.66	0.66
SPERCH8	Individual	0.73	0.72	0.72
SPERCH9		0.75	0.69	0.69
SPERCH10		0.65	0.70	0.70

The factor loadings for the Alternative Models which are presented in Table 5.17 ranged from 0.65 to 0.79. Factor loadings for Three Factor Hierarchical Model showed the same values as the Three-Factor Correlated Model, while the Three Factor Orthogonal Model showed only slight differences in factor loadings. In relation to fit indices, the Three Factor Hierarchical Model showed a better fit compared to the other models. The fit indices of these models are presented in Table 5.18.

Table 5. 18 Fit Indices for the Alternative Models

INDICES	Three-Factor Orthogonal SPERCH	Three-Factor Correlated SPERCH	Three-Factor Hierarchical SPERCH
Chi –Square (x^2)	2332.47	258.97	262.47
Degree of Freedom (df)	35	32	34
$\frac{x^2}{df}$	66.6	8.09	7.72
Tucker-Lewis Index (TLI)	0.46	0.94	0.94
Comparative Fit Index (CFI)	0.65	0.97	0.97
Root Mean Square Error of Approximation (RMSEA)	0.19	0.07	0.06

The value of chi-square divided by the degree of freedom ($\frac{x^2}{df}$) of the alternative models was well over 5, which indicates a poor fit to the data. However, the values of the RMSEA index for the Three-Factor correlated (0.07) and Hierarchical Models (0.06) showed a reasonable level of fit. In addition, TLI and CFI showed values above than 0.90 for both models. These values indicated that both models did fit the sample data. Based on the RMSEA values, it was concluded that the Hierarchical Model was the best fit for the sample data and consequently used for the subsequent analysis.

5.8 Summary

The students' instruments comprised three questionnaires: (a) the classroom climate (ICEQ),

(b) the students' learning process (LPQ), and (c) the perception towards learning History (SPERCH). The validation was based on the sample data of 1653 students.

Each instrument underwent the same process of validation, using Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA) as required. Two sets of models were discussed in detail for all questionnaires, the Baseline Confirmatory and Alternative Models. The CFA and EFA were discussed in terms of the factor loadings and model fit indices. All instruments were tested for the model fit to the sample data. Finally, the alternative model which had the best fit was selected for further analyses. Across the three instruments, the models used in this study were as follows.

1. The Individualised Classroom Environment Questionnaire (ICEQ) was developed by Barry Fraser's (1990). ICEQ measured the effect of the classroom environment

of History students. For this instrument, the Five Factor Hierarchical (for both CCA and CCP) was chosen for the further analysis.

2. The Learning Process Questionnaires (LPQ) was developed by Biggs (1987) to measure students' learning approaches. From the results of the CFA, the Six Factor Hierarchical Second Order Models was chosen for further analysis.

3. The Students' Perception of History Questionnaire (SPERCH) was developed by the researcher and was based on the History Learning Objectives in the Malaysian History syllabus (Ministry of Education, Malaysia, 2002). This instrument was developed to explore the students' perceptions of the learning outcomes in the History classroom. As a result of the CFA, the Hierarchical Model was selected for further analysis.

The following chapter reports and discusses the findings concerning the relationships among teachers' variables using Partial Least Square Path Analysis (PLSPATH).

Chapter 6 Respondents' Demographic Information and Out-of-field and In-field Teachers Differences

6.1 Introduction

Respondents' Demographics

In the first part of this chapter, the demographic information of the 1653 student and 52 teacher respondents from 18 public schools in Kuala Lumpur are described. The SPSS program was used to analyse the descriptive data on gender, age, ethnic groups, education, as well as occupation and the results are presented in this chapter. The second part of the chapter considers the comparison between the out-of-field and in-field teachers using the *t*-test procedure on a range of variables. These include, teaching experience, teaching conceptions, teaching methods, teaching approaches, as well as students' classroom climate, preferred and actual, students' learning approaches and students' learning outcomes in History. The scale scores for each of the constructs discussed were calculated using AMOS factor score weights. The results presented in this chapter are important as they provide the necessary preparation for subsequent analyses.

6.2 Teachers' Demographics

Gender and Age

Table 6.1, as well as Figures 6.1 and 6.2, depict the teachers' distribution according to their gender and age. Of the 52 teachers, 37 (71.2%) were females and 15 (28.8%) were males. The largest group of teachers were those between the age of 31 and 40 years old (40%). The second and third largest groups in this study were in the age group 21-30 years (25%) and the age group 41-50 years (21. %) respectively. In total, 87% of respondents were in the age group range 21-50 years.

Table 6. 1 Gender and Age of the Teacher Respondents

	Frequency	Percentage
Gender		
Male	15	28.8
Female	37	71.2
Total	52	100
Age (years)		
Below 20	0	0
21-30	13	25.0
31-40	21	40.3
41-50	11	21.2
Above 50	7	13.5
Total	52	100.0

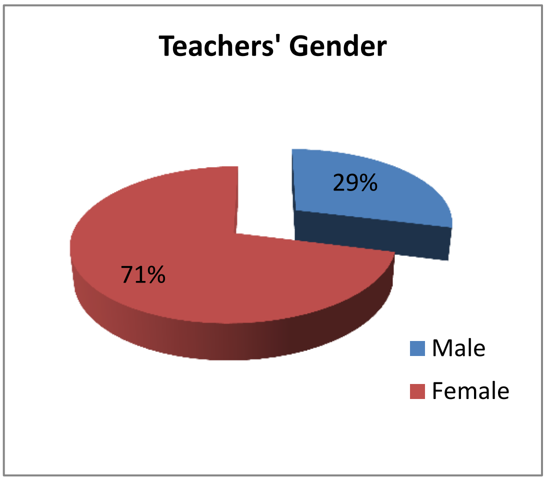

Figure 6. 2 Teachers' Gender

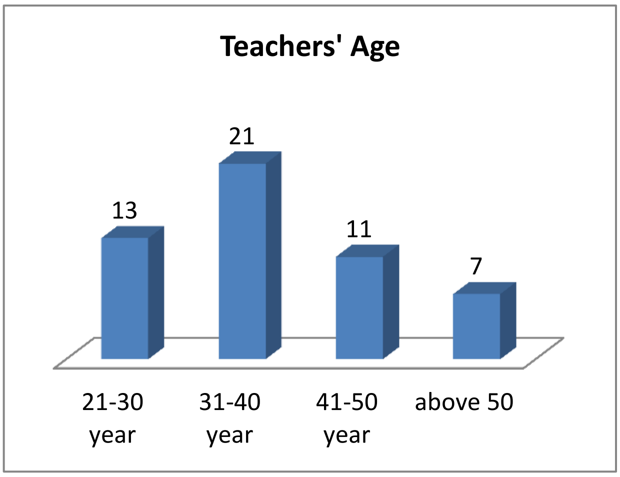

Figure 6. 1 Teachers' Age

Ethnic Groups

There are three main ethnic groups in Malaysia: Malay, Chinese, and Indian as shown in Table 6.2 and Figure 6.3. The majority of teachers were Malay (40 or 77%), followed by Chinese (6 or 11%), with three (6%) being Indian and the remaining three from other indigenous races (6%).

Table 6. 2 Teachers' Ethnic Group

Ethnic Groups	Frequency	Percentage
Malay	40	76.9
Chinese	6	11.5
Indian	3	5.77
Other Ethnic	3	5.77
Total	52	100.0

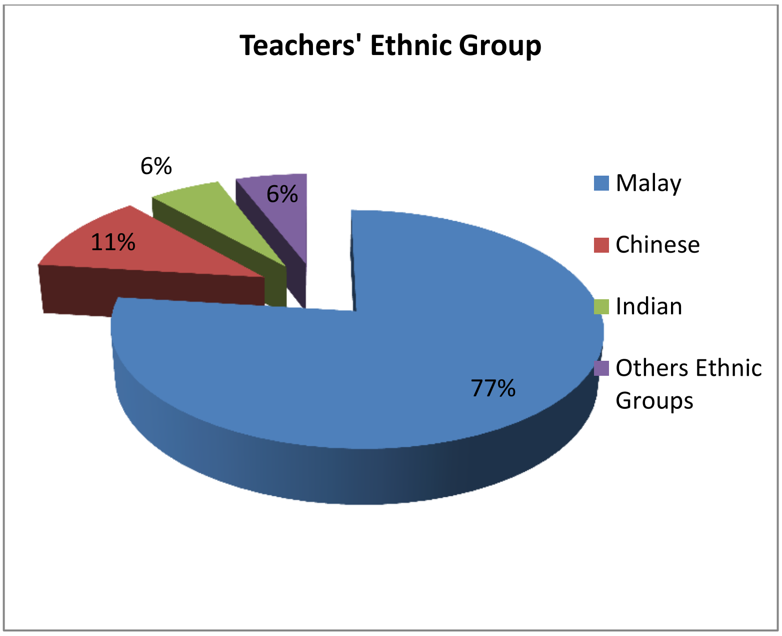

Figure 6. 3 Teachers’ Ethnic Group

Level of Education

All the teachers (52) involved in this research held bachelor degrees and were graduates from various universities in Malaysia. Of the 52 teachers, 16 (30.7%) also held a diplomas in either education, early education, investment analysis, or management. Besides that, there were four (7.69%) teachers who had a master’s degree in education (see Table 6.3 and Figure 6.4). In summary, there were 26 out-of-field teachers and 26 in-field History teachers, with the difference between them being that the qualifications of the out-of-field teachers did not include any specialisation in History.

Table 6. 3 Teacher Respondents' Distribution According to their Qualification Level

Qualification Level	Frequency	Percentage
Master & Bachelor Degree	4	7.69
Diploma & Bachelor Degree	16	30.7
Bachelor Degree	32	61.5
Total	52	100.0

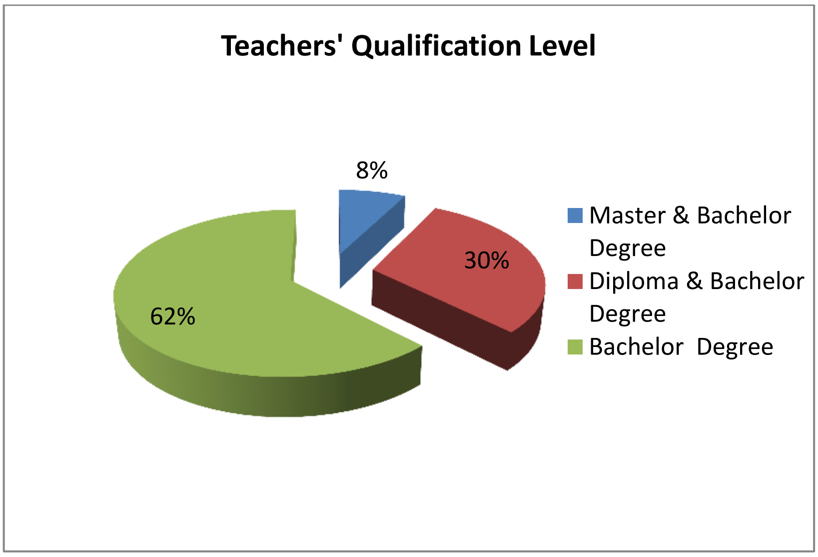

Figure 6. 4 Teacher Respondents' Qualification Level

Work experience

The retirement age of government servants in Malaysia is 60 years, according to government policy. The retirement age applies to everybody regardless of their qualification or position in the school (Public Service of Department of Malaysia, 2008). Most of the teachers in this research had taught between 2-5 years, (29%). A small number of respondents had served between 21-25 years (5%). Only five (9%) teachers had worked for more than 25 years. Moreover, 20% of the teachers had worked between 6-10 years, 17% for 11-51 years, 13% for 16-20 years, and 6% for 0-1year (see Table 6.4 and Figure 6.5).

Table 6. 4 Teacher Respondents’ Distribution According to Work Experience

Work Experience (years)	Frequency	Percentage
0-1	3	5.7
2-5	15	29.0
6-10	11	21.2
11-15	9	17.3
16-20	6	11.5
21-25	3	5.7
> 25	5	9.6
Total	52	100.0

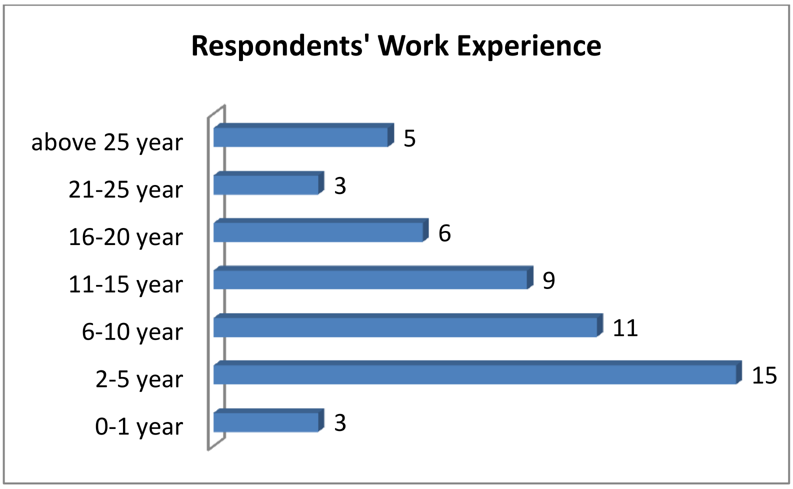

Figure 6. 5 Teachers’ Work Experiences

6.3 Students' Demographics

Gender and Age

From the total of 1653 student respondents, 963 (58.3%) were female and 689 (41.7%) were male. The gender and age breakdown are shown in the table and figures below. There were two age groups in this study. As mentioned in Chapter 1, the respondents were Form Four students, with an average age of 16 years old. However, there were a few who were 17 years old at the time of the study. This is because these students came from Chinese school where they had joined the secondary school a year later than the students selected from the government schools. The largest group of students were 16 years of age (95%), followed by those who were 17 years of age (4%). The data with regard to the students' age are given in Table 6.5 and Figures 6.6 and 6.7 below.

Table 6. 5 Gender and Age of Student Respondents

	Frequency	Percentage
Gender		
Male	689	41.7
Female	964	58.3
Total	1653	100
Age (years)		
16	1580	95.6
17	73	4.4
Total	1653	100

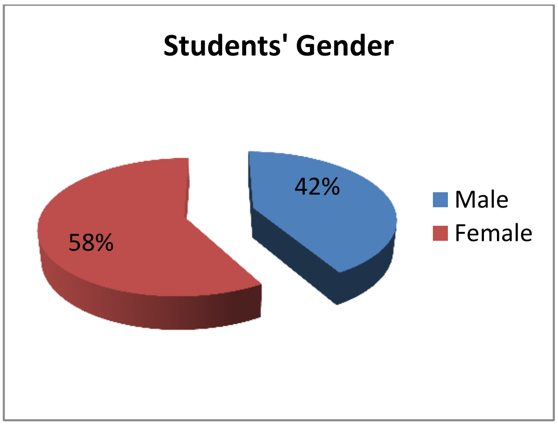

Figure 6. 7 Students' Gender

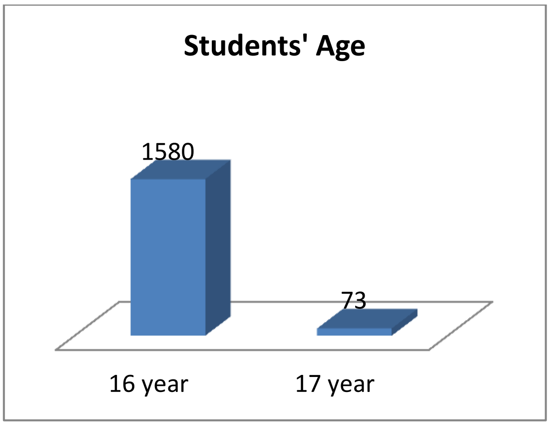

Figure 6. 6 Students' Age

Ethnic Group

The sample of students selected in this study came from diverse groups, such as Malays, Chinese, Indian and various ingenious groups, as shown in Table 4.6 and Figure 4.8. The majority of the respondents were Malays, totalling 1038 of the students (62.8%). This was followed by the Chinese which consisted of 476 students' (28.8%). The third group were the Indian students who amounted to 101 (6.1%) and the smallest group of the respondents who came from other ethnic groups consisted of 38 students (2.3%).

Table 6. 6 Student Respondents' Ethnic Group

Ethnic Groups	Frequency	Percentage
Malay	1038	62.8
Chinese	476	28.8
Indian	101	6.1
Others Ethnic Groups	38	2.3
Total	1653	100.0

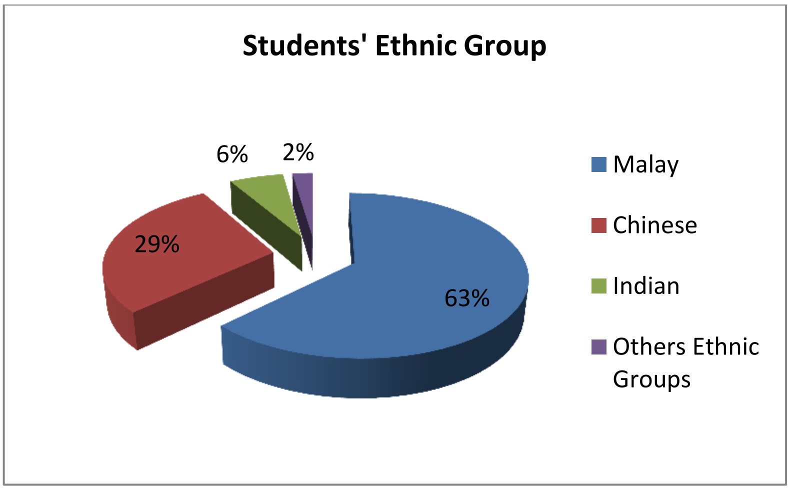

Figure 6. 8 Students' Ethnic Group

Mother's Education Level

In terms of education level, about 60% of the students' mothers had completed their primary and high school education and 27% of the respondents' mothers had at least a tertiary education background (Diploma or university degree) as presented in Table 6.7 and Figure 6.9.

Table 6. 7 Mothers' Education Level

Education level	Frequency	Percentage
No formal education	24	1.5
Primary education	127	7.7
Secondary education	926	56.0
Diploma	255	15.4
Degrees	146	8.8
Post graduate	57	3.4
Sub total	1535	92.9
No Answer	118	7.1
Total	1653	100.0

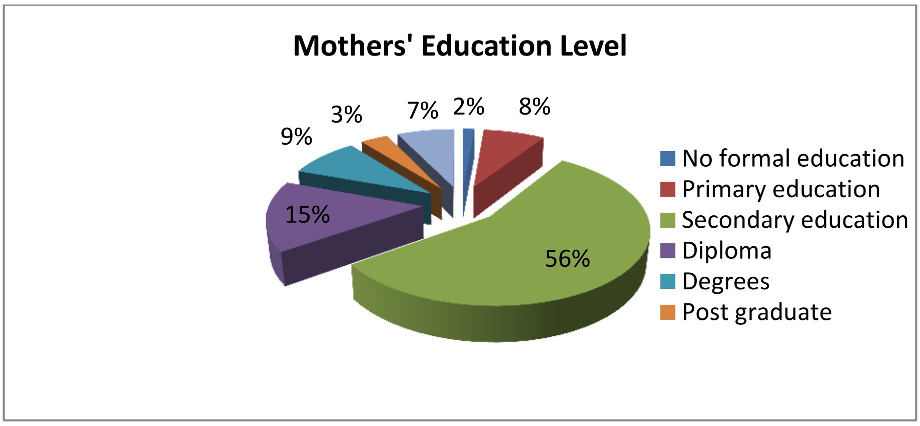

Figure 6. 9 Mothers' Education Level

Father's Education Level

Table 6.8 and Figure 6.10 present the students' fathers' education background. It shows that 54.3% of the respondents' fathers had a tertiary diploma or a university degree, with 34% having only primary and high school background.

Table 6. 8 Fathers' Education Level

Education level	Frequency	Percentage
No formal education	23	1.4
Primary education	94	5.7
Secondary education	804	48.6
Diploma	252	15.2
Degrees	216	13.1
Post graduate	103	6.2
Sub total	1492	90.2
No Answer	161	9.73
Total	1653	100.0

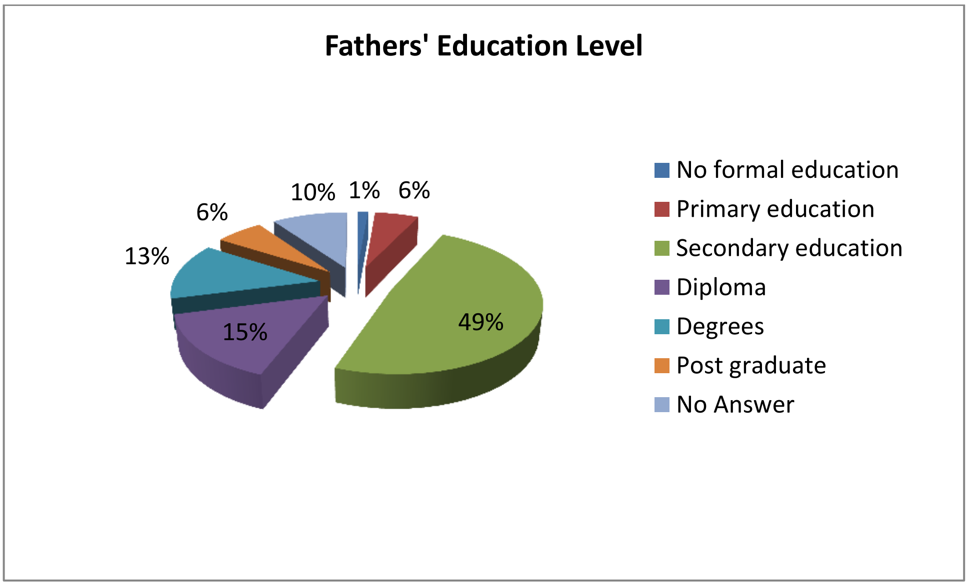

Figure 6. 10 Fathers' Education Level

Mothers' Occupation

Table 6.9 and Figure 6.11 present information on the mothers' occupation, based on the occupational classification used in Malaysia (Ministry of Human Resource, 2008). Most of the respondents 288 (17.3%) worked in the Professional group. A small number of respondents were from Plant & Machine-operators & Assemblers and Armed Forces, with each of these groups having (1%) of respondents each. In summary, out of 1653 under two fifths or 632 (38.5%) of the mothers were working, while, the remaining 1016 (61.5%) were not.

Table 6. 9 Respondents Mothers' Occupation

Occupational Classification	Frequency	Percentage
Managers	88	5.3
Professionals	286	17.3
Technicians & Associate Professionals	37	2.2
Clerical Support Workers	118	7.1
Service & Sales Workers	76	4.6
Craft & Related Trades Workers	6	0.4
Plant & Machine-operators & Assemblers	2	0.1
Elementary occupations	22	1.3
Armed Forces Occupations	2	0.1
Total	637	38.5
No Job	1016	61.5
Total	1653	100.0

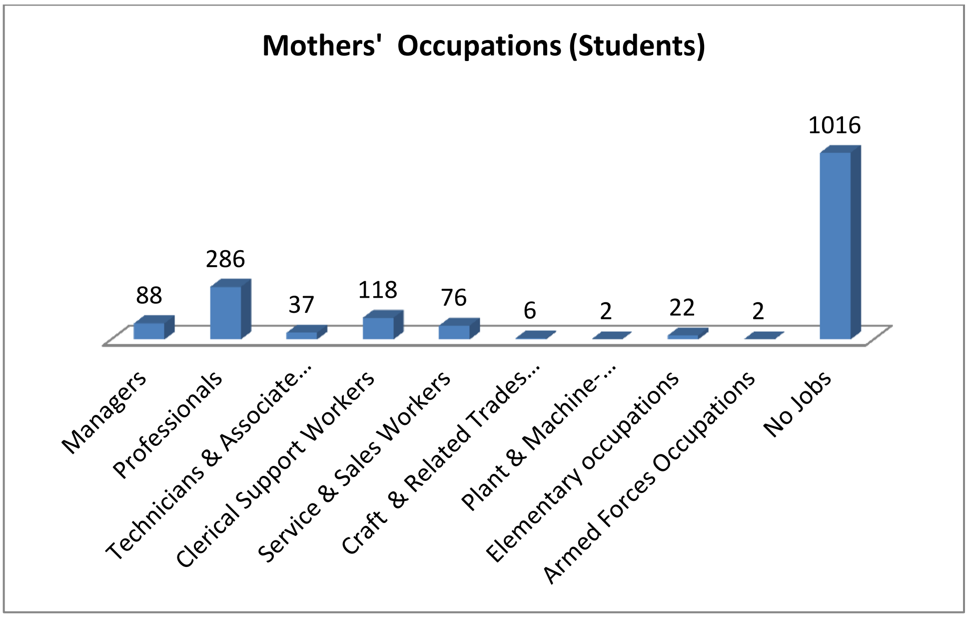

Figure 6. 11 Mothers' Occupations (Students)

Fathers' Occupation

Table 6.10, and Figure 6.12 show that more than three quarters of the respondents' fathers (1293 or 78.2%) worked in one of the 10 sectors (Ministry of Human Resource 2008). Most of the fathers, 392 (23.7%) worked in the Service and Sales sectors. The second largest group was Professional (289 or 17.5%), with only one person (1%) working in the Skilled Agricultural, Forestry and Fishery sector. There were 360 fathers (21.85%) who were unemployed.

Table 6. 10 Fathers' Occupation

Occupational Classification	Frequency	Percentage
Managers	128	7.7
Professionals	289	17.5
Technicians & Associate Professionals	92	5.6
Clerical Support Workers	79	4.8
Service & Sales Workers	392	23.7
Skilled Agricultural, Forestry & Fishery Workers	1	0.1
Craft & Related Trades Workers	97	5.9
Plant & Machine-operators & Assemblers	131	7.9
Elementary Occupations	48	2.9
Armed Forces Occupations	36	2.2
Sub total	1293	78.2
No Jobs	360	21.8
Total	1653	100.0

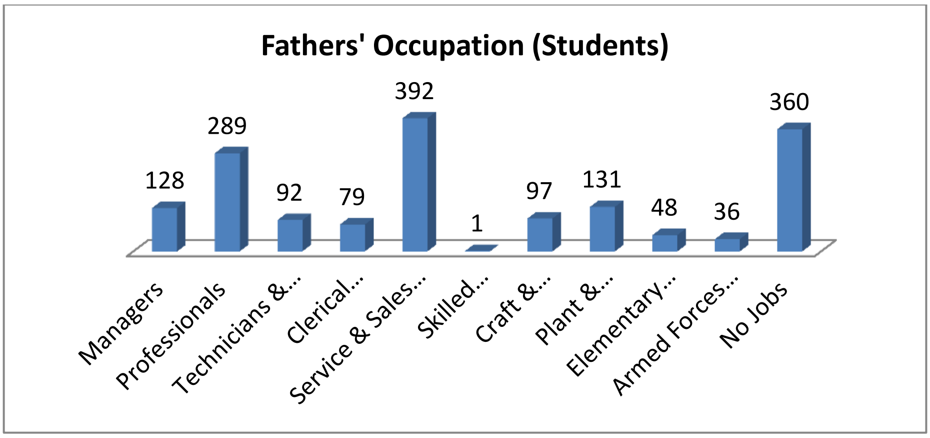

Figure 6. 12 Fathers' Occupations (Students)

6.4 Comparisons of out-of field and in-field History teacher: Teachers' and Students' characteristics

This study was focused on two groups of teachers, out-of-field and in-field History teachers in Malaysian secondary schools. The two independent samples *t*-test was used to compare out-of-field and in-field History teachers on a range of teacher characteristics (teaching experience, teaching conceptions, teaching approaches and teaching method) and the characteristics of students they taught (classroom climate actual, classroom climate preferred, students' learning approaches and History learning outcomes).

Teachers' Characteristics

Years of teaching (TExperience)

Table 6. 11 Descriptive statistics for teacher experience

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
TYRTEAC	out-of-field	26	7.4704	8.00605	1.54076	.002	-7.49117
	in-field	26	14.9615	8.39276	1.64596		

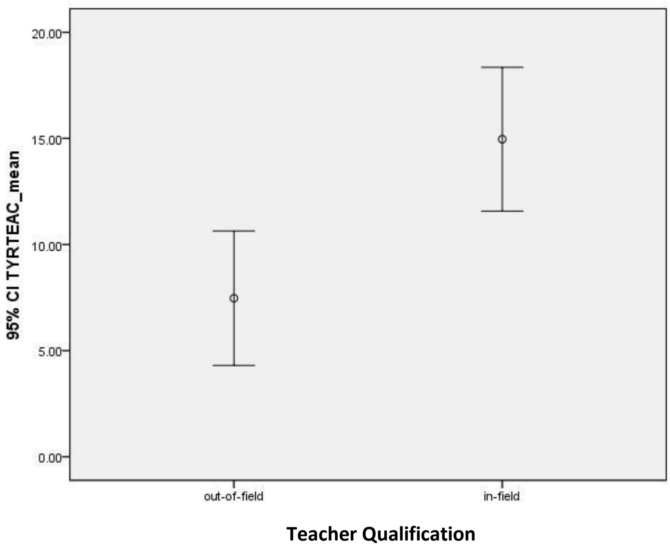

Figure 6. 13 Years of teaching (Teacher experience) reported by in-field and out-of-field teachers

To investigate the difference in experience between the out-of-field (OFT) teachers and the in-field (IF) History teachers, the independent sample t-test was carried out. The results showed that there was a significant ($p = 0.002$) difference in the average number of years teaching between the two groups of History teachers (see Table 6.11 and Figure 6.13). Out-of-field teachers had an average of seven and a half years of experience compared to in-field teachers who had more than 14 years' experience of teaching. This indicates that in-field teachers are more experienced in teaching History compared to the out-of-field teachers, as the two error-bar plots in Figure 4.1 demonstrate the mean, within the 95% confidence intervals of the teacher experience.

Teaching Conceptions (TCont)

Table 6. 12 Descriptive statistics for teacher conceptions

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
TAbilityDev	out-of-field	26	-.1135	.89452	.17215	.270	-.29987
	in-field	26	.1864	1.05887	.20766		
TAttPro	out-of-field	26	-.1282	.78391	.15086	.220	-.32502
	in-field	26	.1968	1.10134	.21599		
TKnowDeli	out-of-field	26	-.0271	.86917	.16727	.766	-.08231
	in-field	26	.0552	1.11981	.21961		
TExamPrep	out-of-field	26	.0152	.85520	.16458	.887	-.03928
	in-field	26	.0545	1.12589	.22081		
TConDance	out-of-field	26	-.2549	.97406	.18746	.031	-.57593
	in-field	26	.3210	.91090	.17864		

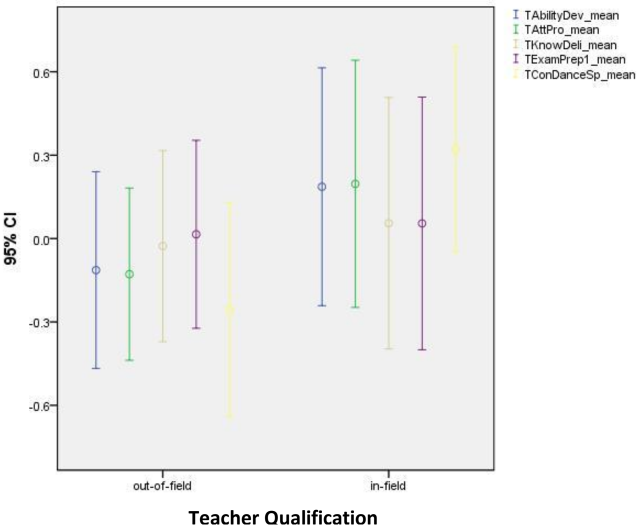

Figure 6. 14 Teaching conceptions reported by in-field and out-of-field teachers

In terms of teaching conceptions, there were five dimensions used to reflect the latent variable 'Teaching Conceptions (TCont)', namely: AbilityDev, AttPro, KnowDeli, ExamPrep and ConDance. Table 4.12 shows the comparison between the in-field (IF) and the out-of-field (OFT) History teachers for the five dimensions. The results of independent sample t-test showed that there were no significant differences between the two groups for four out of five dimensions tested. A significant difference was found only for the dimension of conduct guidance (ConDance). This dimension measured the teachers' influence as role model and nurturer of good conduct in the classroom. The results showed that in-field teachers had a higher level of conception than the out-of-field teachers with respect to presenting good role models and guiding students toward good conduct.

Teaching Approaches (TApp)

Table 6. 13 Descriptive statistics for teaching approaches

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
TInfoTrans	out-of-field	26	2.4426	.40905	.07872	.909	.01390
	in-field	26	2.4287	.47253	.09267		
TConChan	out-of-field	26	2.8470	.42877	.08252	.449	-.08369
	in-field	26	2.9307	.36541	.07166		

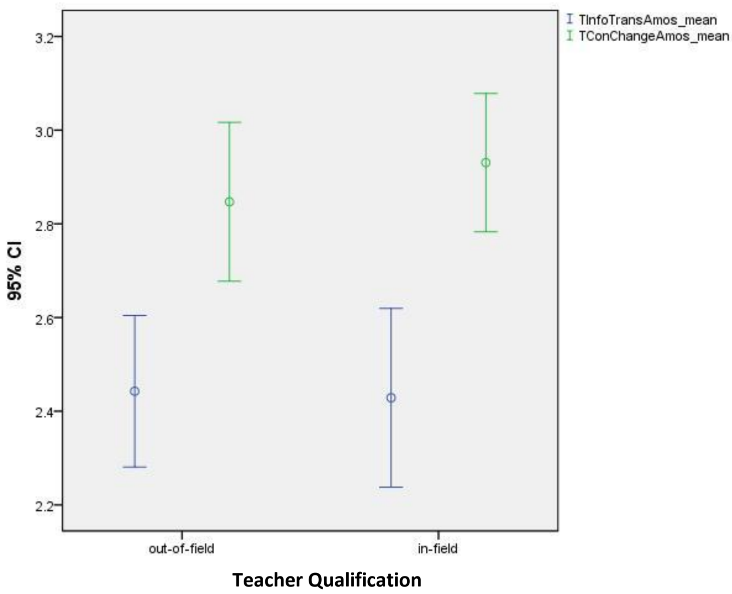

Figure 6. 15 Teaching approaches reported by in-field and out-of-field teachers

Two scales were used to measure the constructs of teaching approaches (TApp), namely: conceptual change or student or focused (CCSF) and information transmission or teacher-focused (ITTF) scale, labelled as TConChan and TInfoTrans respectively. The comparison between in-field (IF) and out-of-field (OFT) History teachers in relation to their teaching approaches are presented in Table 6.13 and Figure 6.15. Even though the differences were not significant for any scales, the patterns are worth being considered. In general, in-field teachers focused more on conceptual change and less on the information transfer compared to out-of-field teachers.

Teaching Methods (TMet)

Table 6. 14 Descriptive statistics for teaching methods

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
TEftTea	out-of-field	26	2.4777	.48673	.09367	.044	-.24464
	in-field	26	2.7224	.36417	.07142		
TActTea	out-of-field	26	2.2987	.43679	.08406	.119	-.19479
	in-field	26	2.4935	.45660	.08955		

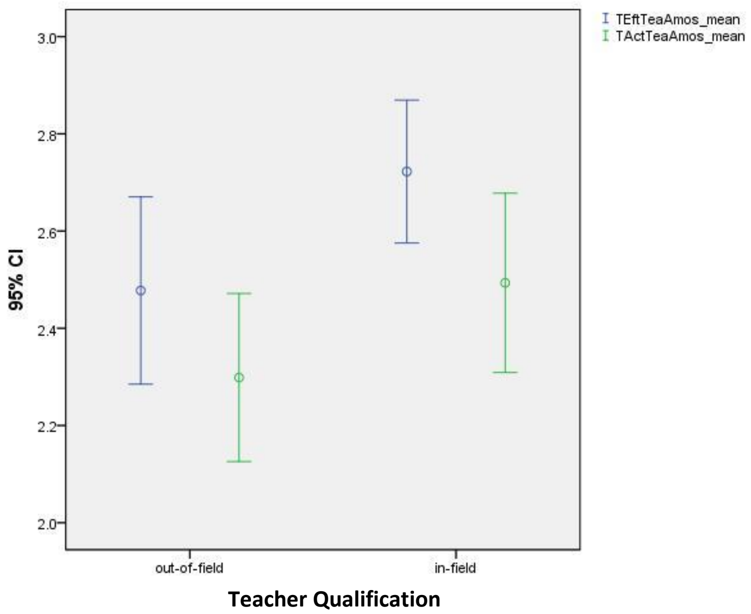

Figure 6. 16 Teaching methods used, as reported by in-field and out-of-field teachers

Effective teaching (TEff) and active teaching (TAct) were the two constructs used to reflect teacher teaching method (TMet). The results showed that there was no significant difference in the use of active teaching methods, even though in general in-field teachers had a slightly higher average on both constructs. However, it can be seen from Figure 6.16, that in-field teachers had a significantly higher level of effective teaching in their classrooms (p = 0.044).

Student Characteristics

Classroom Climate Preferred (CCP)

Table 6. 15 Descriptive statistics for classroom climate preferred (CCP)

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
SINV	out-of-field	26	.6688	.04251	.00818	.002	-.03512
	in-field	26	.7040	.03538	.00694		
SPERSO	out-of-field	26	1.9052	.19632	.03778	.002	-.15190
	in-field	26	2.0571	.14510	.02846		
SPARTI	out-of-field	26	2.8109	.23864	.04593	.003	-.17981
	in-field	26	2.9907	.17936	.03518		
SIND	out-of-field	26	1.4915	.21196	.04079	.127	.10415
	in-field	26	1.3874	.27362	.05366		
SDIFFER	out-of-field	26	-1.4713	.16025	.03084	.003	.13393
	in-field	26	-1.6052	.14973	.02937		

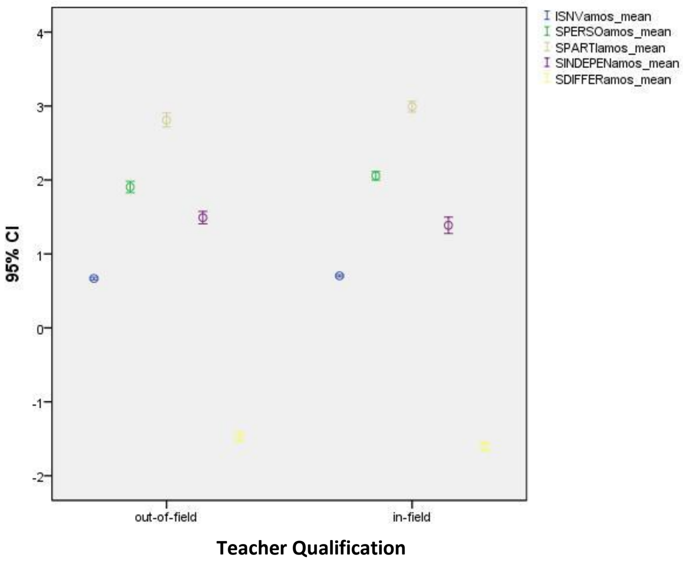

Figure 6. 17 Classroom Climate Preferred (CCP) reported by students under in-field and out-of-field teachers

Five dimensions were used to examine the preferred climate of History classrooms (CCP), namely: investigation (INV), personalization (PERSO), participation (PARTI), independence (IND) and differentiation (DIFFER). The comparisons between the in-field and the out-of-field History teachers on the five dimensions are presented in Table 6.15 and Figure 6.17. Out of the five dimensions tested, four of them showed significant differences between the two groups, investigation (INV), personalisation (PERSO), participation (PARTI) and differentiation (DIFFER). This result indicates that students under in-field teachers preferred to have classrooms with higher levels of investigation (INV), personalisation (PERSO), participation (PARTI) and differentiation (DIFFER). For the fifth dimension, the independence (IND), the difference was not significant.

Classroom Climate Actual (CCA)

Table 6. 16 Descriptive statistics for classroom climate actual (CCA)

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
SPar	out-of-field	26	1.6094	.18802	.03619	.151	.07383
	in-field	26	1.5356	.17996	.03529		
SInd	out-of-field	26	1.6010	.19181	.03691	.452	-.04426
	in-field	26	1.6452	.23231	.04556		
SPer	out-of-field	26	1.9052	.19632	.03778	.002	-.15190
	in-field	26	2.0571	.14510	.02846		
SInv	out-of-field	26	1.9569	.15184	.02922	.343	.04602
	in-field	26	1.9109	.19588	.03842		
SDfr	out-of-field	26	1.1122	.11641	.02240	.023	.07993
	in-field	26	1.0322	.13225	.02594		

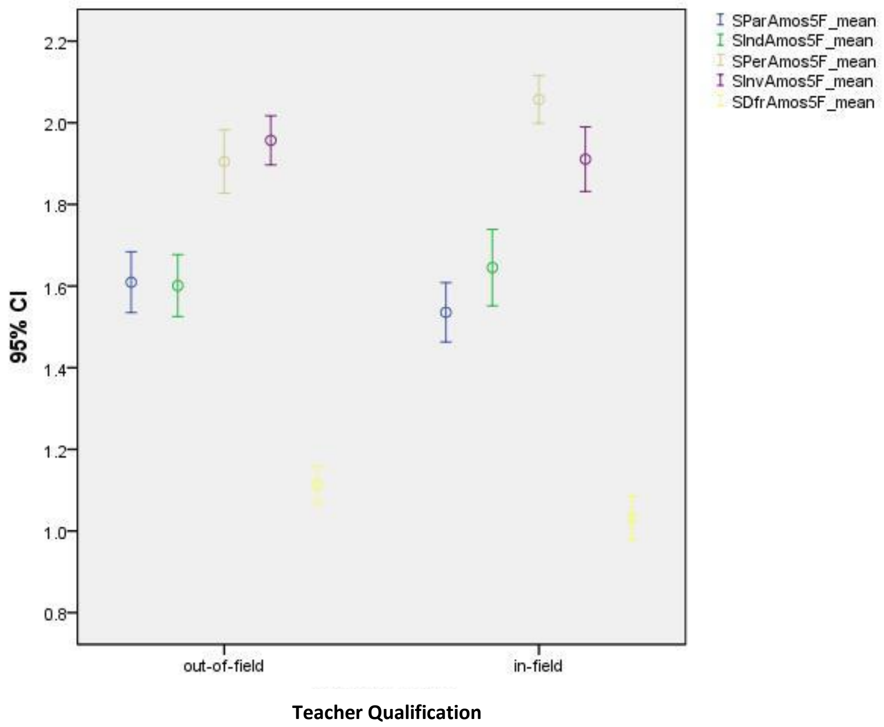

Figure 6. 18 Classroom Climate Actual (CCA) reported by students of in-field and out-of-field teachers.

There were five dimensions used to reflect the actual History classroom climate (CCA), namely: investigation (SInv), personalisation (SPer), participation (SPar), independence (SInd) and differentiation (SDiffer). The comparisons between the in-field and the out-of-field History teachers for these five dimensions are presented in Table 6.16 and Figure 6.18. Out of five dimensions tested, only one of the dimensions demonstrated significant difference between the two groups. The personalization (SPer) showed a significant difference (p= 0.002), indicating that students under in-field teachers experienced a more personalised classroom climate. However, the patterns are worth mentioning; with the results suggesting that students under out-of-field teachers tended to have a classroom climate that was more investigative, independence, participative and differentiated.

Learning Approaches (Learning)

Table 6. 17 Descriptive statistics for student learning approaches (Learning)

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
SSM	out-of-field	26	.7960	.04527	.00871	.174	.01505
	in-field	26	.7809	.03287	.00645		
SSS	out-of-field	26	1.9352	.10286	.01979	.057	.05833
	in-field	26	1.8769	.11525	.02260		
SAM	out-of-field	26	3.3026	.20706	.03985	.352	.04616
	in-field	26	3.2565	.14401	.02824		
SAS	out-of-field	26	2.9093	.16012	.03081	.947	.00247
	in-field	26	2.9069	.10088	.01978		
SDM	out-of-field	26	2.4286	.15192	.02924	.658	.01618
	in-field	26	2.4124	.10824	.02123		
SDS	out-of-field	26	2.4926	.13732	.02643	.976	.00097
	in-field	26	2.4917	.09471	.01857		

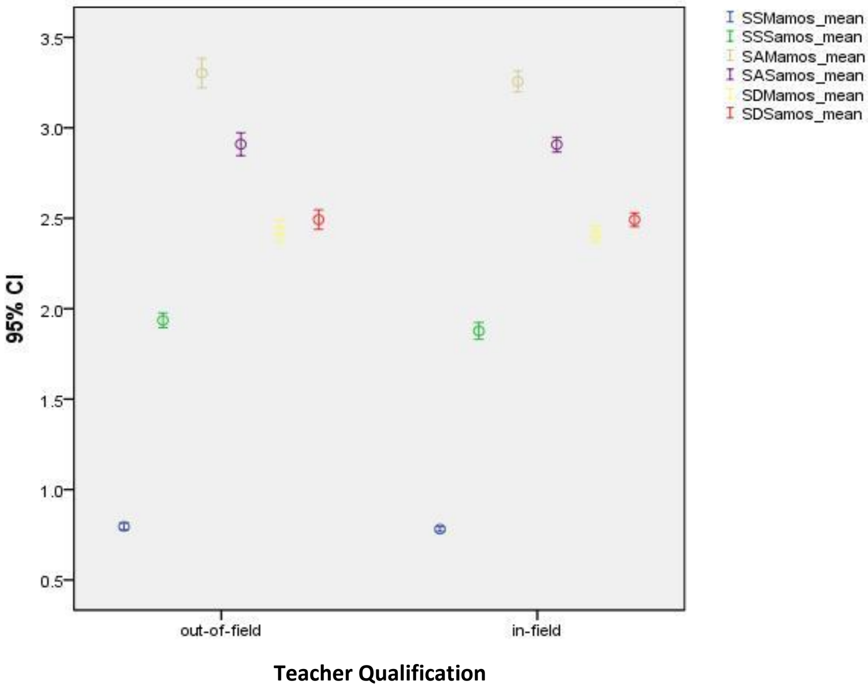

Figure 6. 19 Learning Approaches used by students under in-field and out-of-field teachers

Table 6.18 and Figure 6.19 show the comparison between in-field (IF) and out-of-field (OFT) History teachers for the six sub-scales of student learning approaches, namely: students' surface motive (SSM), students' surface strategy (SSS), students' achieving motive (SAM), students' achieving strategy (SAS), students' deep motive (SDM), and students' deep strategy (SDS). There were no significant differences on any of these constructs, showing that in general students under in-field and out-of-field were adopting very similar approaches to learning.

Students' Learning Outcomes (SOUTCOME)

Table 6. 18 Descriptive statistics for Students' Learning Outcomes in History

	Type of teachers	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Mean Difference
SCountry	out-of-field	26	3.3746	.26623	.05124	.592	.03540
	in-field	26	3.3392	.20693	.04058		
SComm	out-of-field	26	3.3084	.23555	.04533	.689	-.02423
	in-field	26	3.3326	.20129	.03948		
SIndividual	out-of-field	26	3.5570	.26221	.05046	.921	-.00647
	in-field	26	3.5635	.20586	.04037		

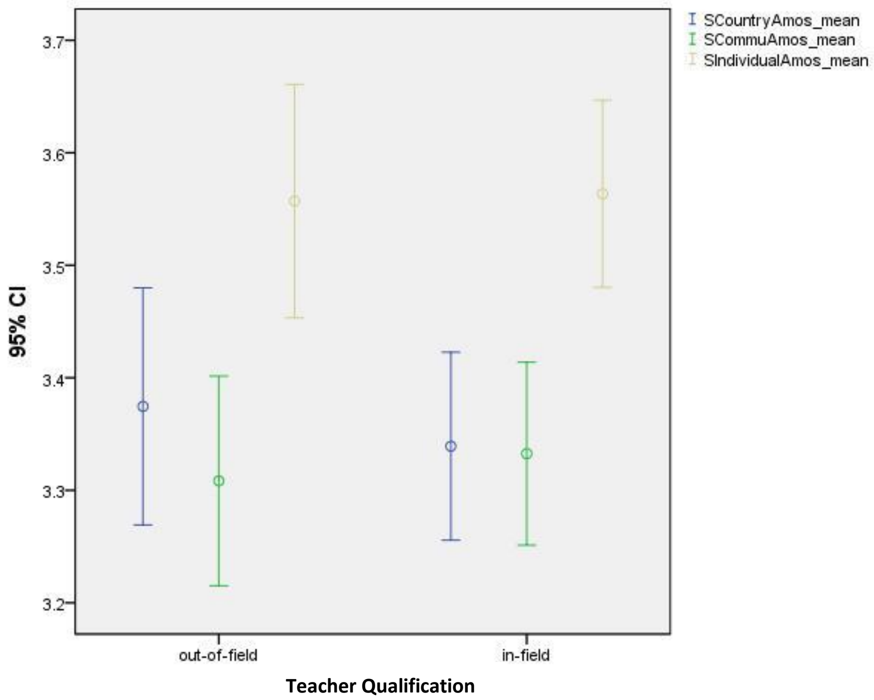

Figure 6. 20 Students' Learning Outcomes in History reported by students under in-field and out-of-field teachers.

There were three constructs used to measure students' learning outcome (SOUTCOME) namely Country (SContry), Community (SComm) and Individual (SIndividual). Table 6.18 presented the comparison between in-field (IF) and out-of-field (OFT) History teachers with respect to the students' learning outcomes. The two-error plots in Figure 6.20 show the mean and the 95% confident intervals of the student learning outcome. There were no significant differences found for any of the three constructs.

6.5 Summary

The information presented in the first part of this chapter shows the demographic distribution for all respondents, both teachers and students. Over two-thirds (71.7%) of the teachers were females and two fifths were aged between 31 and 40 years (40%). All of the teachers had at least a tertiary diploma or university degree from local universities. Most of the teachers had worked between 2 and 5 years in public schools in Malaysia and the majority were from the Malay ethnic group.

In the case of the students, most were 16 years old, and more than a half (58.3%) were female. In terms of ethnicity, almost two-thirds (62.8%) were Malays. Over half of the mothers were not employed but almost one fifth (17.3%) worked professionally, and nearly one quarter (23.7%) respondents' fathers worked at the Service & Sales sectors.

Comparisons between out-of-field and in-field teachers with respect to their own as well as their students' characteristics and perceptions were discussed in the second part of this chapter. The results showed that the in-field teachers had more experience in teaching History compared to the out-of-field teachers. In terms of teaching conceptions, the conduct guidance dimension was found to differ significantly, but not the other dimensions. This indicated that in-field teachers had higher levels of nurturing good conduct in their students, compared to the out-of-field teachers. In addition, the results indicated that students under in-field teachers preferred to have classrooms with higher levels of investigation, personalization, participation and differentiation activities. In their actual classrooms, students under in-field teachers had experienced higher levels of personalisation.. The analyses discussed in the next chapter are based on the results of the descriptive and t-test analyses provided in this chapter.

Chapter 7 Partial Least Squares Path Analysis: Teacher Level

7.1 Introduction

This chapter reports the partial least squares path analyses of the variables at the teacher level, in order to determine the pattern of relationships among teachers' characteristics (age, gender, ethnicity, teacher in-field and out-of-field, and teacher experience), teachers' conceptions of teaching, teacher approaches. History teaching methods, and other compositional variables. These other compositional variables were aggregated from the student level data which included students' characteristics (age, gender, ethnicity), the classroom climate preferred, the classroom climate actual, approaches to learning (Surface, Achieving and Deep approaches), as well as students' perceptions of History learning (SOutcomes). The partial least squares path analysis (PLSPATH) program Version 3.01 (Sellin, 1989) was used in this study. In this chapter, the background of PLSPATH is explained, the problems in methodology, discussed and the process of path analysis and its results reported. All the analyses were based on the teacher data set (52 teachers) and the student data set (1653 students, Form Four).

7.2 Partial Least Squares Path Analysis (PLSPATH)

PLSPATH is a structural equation modelling (SEM) technique that examines structural or causal models with observed variables (Rintaingrum et al., 2009). Broadly, this technique is used for estimating the path coefficients in path models with latent constructs measured by multiple indicators. PLSPATH is particularly useful in situations with large amounts of data and a lack of theoretical knowledge. PLSPATH, does not require stringent distributional assumptions, such as normality. It is referred to as a 'soft modelling' approach, which is useful in research which is exploratory in nature (Sellin, 1995).

Path analysis requires the development of an appropriate structural or causal model and the testing of that model (Falk & Miller, 1992; Sellin 1989; 1995). A model in quantitative studies comes in two forms, either in a series of structural equations or in a graphic description which represents the variables in the study. Byrne (2001) stressed that using the diagrams enables a clearer understanding of the theory. AMOS 17 (Arbuckle, 2008), was used to draw the path diagrams in this study by incorporating the paths coefficients provided by PLSPATH results. Generally, there are four shapes involved in drawing the path diagram; (1) circles or ellipses represent unobserved variables (latent variables), (2) rectangles represent observed variables (manifest variables), (3) single headed arrows represent the impact of one variable on one or more other variables , and (4) double-headed arrows represent covariances or correlations between two of variables (Byrne, 2010).

Inner model and outer model

Two different models of variables are involved in the PLSPATH diagrams. The inner model refers particularly to the relationships between unobserved or latent variables (LVs) - structural model. The outer model specifies the relationships between LVs and their associated observed or manifest variables (MVs) or know as measurement model. (Sellin, 1995). With this technique, relationships between the variables can be divided into two categories. The first category is where the constructs (LVs) are viewed as the cause of the measures. These relationships are labelled as “reflective”, or the manifestations of a construct. Arrows which are drawn from LVs to MVs, known as the outward mode arrows, indicate this relationship. The second relationship category is referred to as “formative”, where the measures are viewed as the cause of the constructs. Formative relationships are indicated by arrows drawn from MVs to the LVs; these are known as inward mode arrows.

Variables Mode & Types of Variables

Generally there were three modes of the variables in the path diagrams. The latent variable can be in the inward mode, in the outward mode, or involved in unity mode with only one manifest variable.

There are three types of variables involved in a model. They are referred to as exogenous, endogenous and criterion variables. The variables that are not dependent on any other variables are referred as exogenous. A variable can be recognised as exogenous when there are no unidirectional arrows pointing towards it. Endogenous variables are dependent on other variables, a relationship indicated by one or more unidirectional arrows pointing to them. Criterion variables are those which are dependent only on other variables (Rintaningrum et al., 2009).

Indices

In this technique, loadings and weights are commonly used to indicate the strength of the relationships between the MVS and LVs. According to Sellin and Keeves (1997), the loadings should be reported where the outward mode is used, and weights should be reported where the inward mode is used. In addition, there are a number of indices, such as, beta, jackknife mean, jackknife standard error and correlation which are used to indicate the strength of the paths or relationships in the inner (structural) model in the PLSPATH analyses.

Procedure

The PLSPATH parameter estimation proceeds in two steps. The first step involves the iterative estimation of latent variables (LVs) as linear composites of their associated manifest variables (MVs). The second step involves the non-iterative estimation of inner model and outer model coefficients. In the second step of PLSPATH analysis, the estimated LVs from the first step are used to estimate the inner model coefficients by means of the standard least square procedure. Thus for recursive inner model (Keeves, 1997) the inner model coefficients are obtained by ordinary least square (OLS) regression, applied to each inner model equation separately. In doing this, the relations between LVs in the path model or inner model indicate causal relationships between LVs. A unidirectional arrow from the determining variables to the dependent variables indicates this relationship.

Advantages of PLSPATH analysis

PLSPATH was chosen for this study because it has many advantages. As a statistical technique, Sellin and Keeves, (1997) claimed that PLSPATH analysis; (a) is flexible and robust in testing complex models, (b) does not require rigorous distributional assumptions of variables; (c) accepts both continuous and dichotomous variables and (d) recognises cluster sample designs in data, as is the case for this study. Moreover, PLSPATH analysis has been described as a soft- modeling approach which could be useful in the investigation of causal-predictive analysis rather than confirmatory analysis (Sellin & Keeves, 1997). In other words, this analysis is less theory-based and more exploratory in nature. Multivariate normality is not required, or even suitable for smaller data sets and smaller models (Nallaya, 2010). In contrast to the Linear Structural Relations (LISREL) model, developed by Joreskog and Wold (1993), PLSPATH analysis was considered as the most flexible and appropriate approach for exploratory analysis of data in one of Keeves (1986) research projects. Furthermore, Lau and Yuen (2011) affirmed that LISREL had important differences from PLSPATH. LISREL is more theory-based and confirmatory in nature. In order to obtain a good fit, the hypothesized model in LISREL needs to fit the covariance matrix of data. This procedure is sometimes called the covariance-based Structural Equation Modeling (SEM). In addition the LISREL approach requires a large sample and multivariate normality of data. As mentioned earlier, this research is a predictive-oriented and exploratory study, thus the PLSPATH analysis was chosen as the tool for testing the hypothesis based theoretical structural model. Furthermore, the PLSPATH technique is appropriate for investigating complex models for exploratory rather than confirmatory purpose (Sellin, 1995).

7.3 Model Building in the PLSPATH analysis

The first step in building the PLSPATH model is to draw the path diagrams of the causal relationships involved in the data analysis (Falk, 1987). According to Sellin (1995), PLSPATH offers an index of the satisfactoriness of a PLSPATH model by estimating the strength of each individual path in the model and thereby enabling the determination of the direct and indirect effects between the variables in the model. As mentioned earlier in Chapter 5, AMOS 17 (Arbuckle, 2008), was used to draw the PATH diagrams. Both the latent and manifest variables needed to be specified in accordance with their causal relationships.

Based on the theoretical framework adapted from the Biggs' Model of Learning (1987) (see Chapter 2) it was purposed that there were three groups of factors involved in learning: presage, process and product. The presage factors were the student characteristics (age, gender, and ethnicity), classroom environment (actual and preferred), and as well as the teacher characteristics (age, gender, ethnicity), in-field, out-of-field, and experiences), teaching approaches, teaching methods and teaching conceptions. The process factor related to students' learning approaches (Surface, Deep and Achieving), and the product factor was the achievement of the History learning objective as perceived by the students.

All factors in the model are related to the hypothesised process factor of students' approaches to learning, which in turn is hypothesised to be linked to the products. Students' perceptions of learning objective in History (country, community, and individual) were proposed as the outcome in this study. All the presage, process and products are included in the path model. Consequently, in the inner model there are 15 latent variables and 42 manifest variables. The hypothesised paths for estimating the relationships between teacher and student variables are displayed in Figure 7.1 and 7.2. As mentioned earlier there are three types of latent variables in PLSPATH; (1) exogenous (independent) variables, which receive no causal inputs from other variables, (2) endogenous (dependent) variables, which receive one or more causal inputs from other variables, (3) criterion variables, which depend only on other variable (Rantaningrum et. al., 2009).Independent variables are also known as antecedent variables, as they are not influenced by other latent variables (LVs).

In this study the exogenous (independent) variables for the teacher level were teachers' age, gender, ethnicity, and years of teaching; for the student level, they were students' age, gender, ethnicity, in-field, and out-of-field History teachers. The endogenous (dependent) variables for the teacher level were teaching approaches, History teaching methods and teaching conceptions, while for student they were classroom environment (actual and preferred), learning approaches (Surface, Deep and Achieving). The criterion variables were the product factors: students' learning objectives in History as a subject (country, community, and individual). The full list of the variables in this study is presented in Tables 7.1 and Table 7.2 in relation to the two Hypothesised Models 1 and 2 labelled Figures 7.1 and 7.3; and the Final Models labelled 1 and 2 as presented in Figures 7.2 and 7.4.

Table 7. 1 Variables at the Teacher Level - Model 1

Latent Variable (Acronym)	**Mode**	**Description**	**Manifest Variables (Acronym)**	**Description**	**Coding**
TAge	unity	Teacher's age	TYear	Age in years	21-50
TGender	unity	Teacher's gender	TGdr	0=Male 1= Female	0=M 1=F
TEthnic	Inward	Teacher's ethnicity	Malay	Malay (Dummy)	0=Not Malay 1=Malay
			Chinese	Chinese	0=Not Chinese 1=Chinese
			Indian	Indian	0=Not Indian 1=Indian
			Other	Iban/Melanau/Thai	0=Not Other 1=Other
TInout	unity	Teacher's qualification	In-field	In-field/ out of-field	0= 0ut of-field 1= In-field
TExp	unity	Teacher Years of teaching	Tytea	Teaching experience in History	Raw Scores
TApp	outward	Teaching approaches	TInfoTra	Information Transfer	Factor Scores
			TConChan	Conceptual Change	Factor Scores
TMet	outward	Teaching Methods	TEft	Teaching Effective	Factor Scores
			Tact	Teaching Active	Factor Scores
TCont	outward	Teaching Conception	TExam	Exam Preparation	Factor Scores
			TKDeli	Knowledge Delivery	Factor Scores
			TAttPro	Attitude Promotion	Factor Scores
			TAbiDev	Ability Development	Factor Scores
			ConDance	Conduct Guidance	Factor Scores
SAge	unity	Student's age	SYear	Age in years	17-18
SGender	unity	Student's gender	SGdr	0=Male 1= Female	0=M 1=F
SEthnic	Inward	Student's ethnicity	Malay	Malay (Dummy)	0=Not Malay 1=Malay
			Chinese	Chinese	0=Not Chinese 1=Chinese
			Indian	Indian	0=Not Indian 1=Indian
			Other	Iban/Melanau/Thai	0=Not Other 1=Other
SCCA	outward	Classroom Climate Actual	Spar	Participation	Factor Scores
			Sind	Independence	Factor Scores
			SPer	Personalisation	Factor Scores
			SInv	Investigation	Factor Scores
			SDfr	Differentiation	Factor Scores
SCCP	outward	Classroom Climate Preferred	SINV	Investigation	Factor Scores
			SPER	Personalisation	Factor Scores
			SPARTICI	Participation	Factor Scores
			SINDEPEN	Independence	Factor Scores
			SDIFFER	Differentiation	Factor Scores
SLearning	outward	Student's Approaches to Learning	SSM	Surface Motive	Factor Scores
			SSS	Surface Strategy	Factor Scores
			SAM	Achieving Motive	Factor Scores
			SAS	Achieving Strategy	Factor Scores
			SDM	Deep Motive	Factor Scores
			SDS	Deep Strategy	Factor Scores
SOutcome	outward	Students' Perception of History Learning	SCountry	Appreciating country	Factor Scores
			SCommunity	Appreciating society	Factor Scores
			SIndividual	Enhance maturity & moral value	Factor Scores

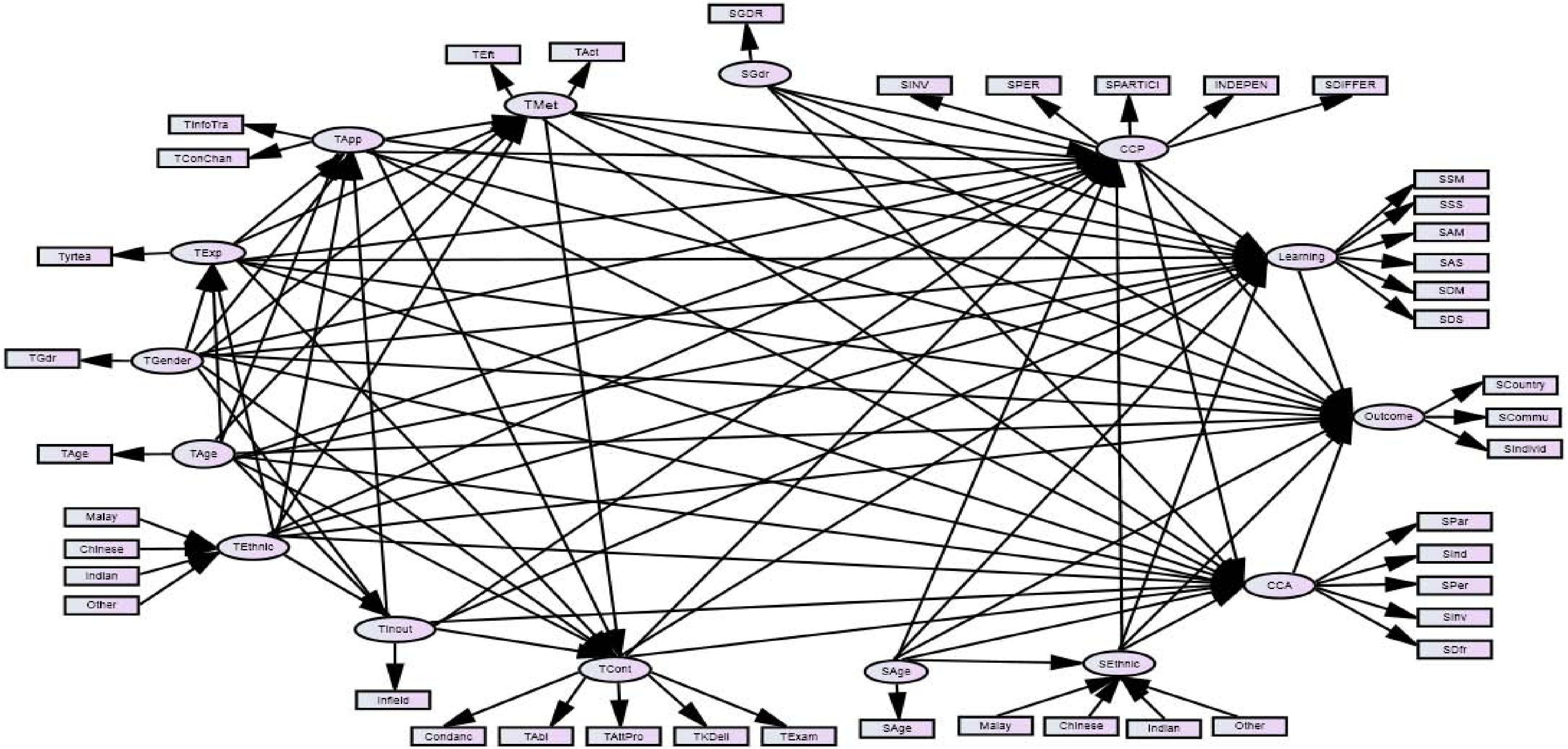

Figure 7. 1 Hypothesised Model for Teachers' Level Model 1

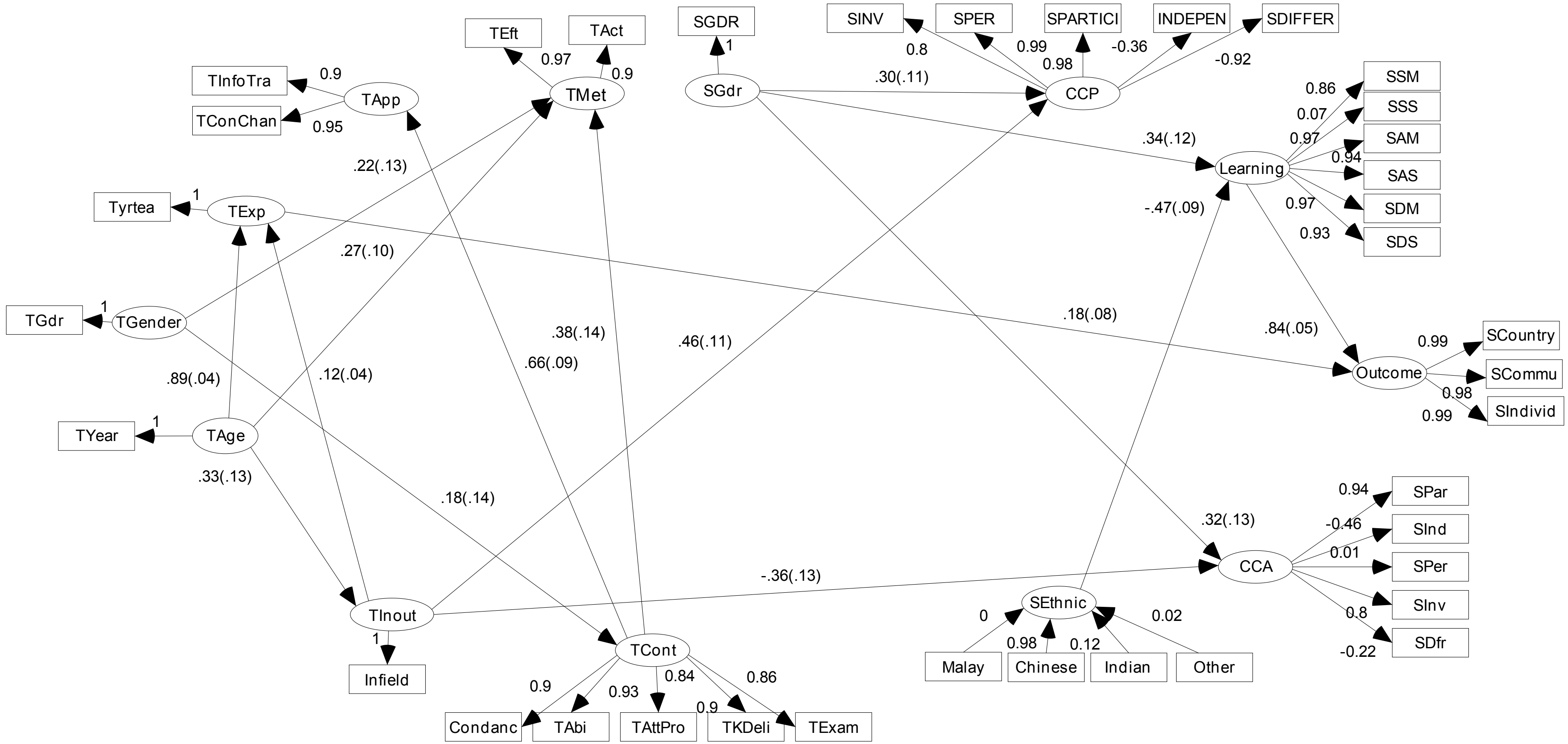

Figure 7. 2 Final Model for Teachers' Level Model 1

Table 7. 2 Variables at the Teacher Level - Model 2

Latent Variable (Acronym)	Mode	Description	Manifest Variables (Acronym)	Description	Coding
TAge	unity	Teacher's age	TYear	Age in years	21-50
TGender	unity	Teacher's gender	TGdr	0=Male 1= Female	0=M 1=F
TEthnic	Inward	Teacher's ethnicity	Malay	Malay	0=Not Malay 1=Malay
			Chinese(Dummy)	Chinese(Dummy)	0=Not Chinese 1=Chinese
			Indian	Indian	0=Not Indian 1=Indian
			Other	Iban/Melanau/Thai	0=Not Other 1=Other
TInout	unity	Respondent's qualification	In-field	In-field/ out of-field	0= out of-field 1= In-field
TExp	unity	Years of teaching	Tytea	Teaching experience in History	Raw Scores
TApp	outward	Teaching approaches	TInfoTra	Information Transfer	Factor Scores
			TConChan	Conceptual Change	Factor Scores
TMet	outward	Teaching Methods	TEft	Teaching Effective	Factor Scores
			Tact	Teaching Active	Factor Scores
TCont	outward	Teaching Conception	TExam	Exam Preparation	Factor Scores
			TKDeli	Knowledge Delivery	Factor Scores
			TAttPro	Attitude Promotion	Factor Scores
			TAbiDev	Ability Development	Factor Scores
			ConDance	Conduct Guidance	Factor Scores
SAge	unity	Student's age	TYear	Age in years	17-18
SGender	unity	Student's gender	SGdr	0=Male 1= Female	0=M 1=F
SEthnic	Inward	Student's ethnicity	Malay (Dummy)	Malay (Dummy)	0=Not Malay 1=Malay
			Chinese	Chinese	0=Not Chinese 1=Chinese
			Indian	Indian	0=Not Indian 1=Indian
			Other	Iban/Melanau/Thai	0=Not Other 1=Other
SCCA	outward	Classroom Climate Actual	Spar	Participation	Factor Scores
			Sind	Independence	Factor Scores
			SPer	Personalisation	Factor Scores
			SInv	Investigation	Factor Scores
			SDfr	Differentiation	Factor Scores
SCCP	outward	Classroom Climate Preferred	SINV	Investigation	Factor Scores
			SPER	Personalisation	Factor Scores
			SPARTICI	Participation	Factor Scores
			SINDEPEN	Independence	Factor Scores
			SDIFFER	Differentiation	Factor Scores
SSurface	outward	Surface Approaches	SSM	Surface Motive	Factor Scores
			SSS	Surface Strategy	Factor Scores
SDeep	outward	Deep Approaches	SAM	Achieving Motive	Factor Scores
			SAS	Achieving Strategy	Factor Scores
SAchieving	outward	Achieving Approaches	SDM	Deep Motive	Factor Scores
			SDS	Deep Strategy	Factor Scores
SOutcome	outward	Students' Perception of History Learning	SCountry	Appreciating country	Factor Scores
			SCommunity	Appreciating society	Factor Scores
			SIndividual	Enhance maturity & moral value	Factor Scores

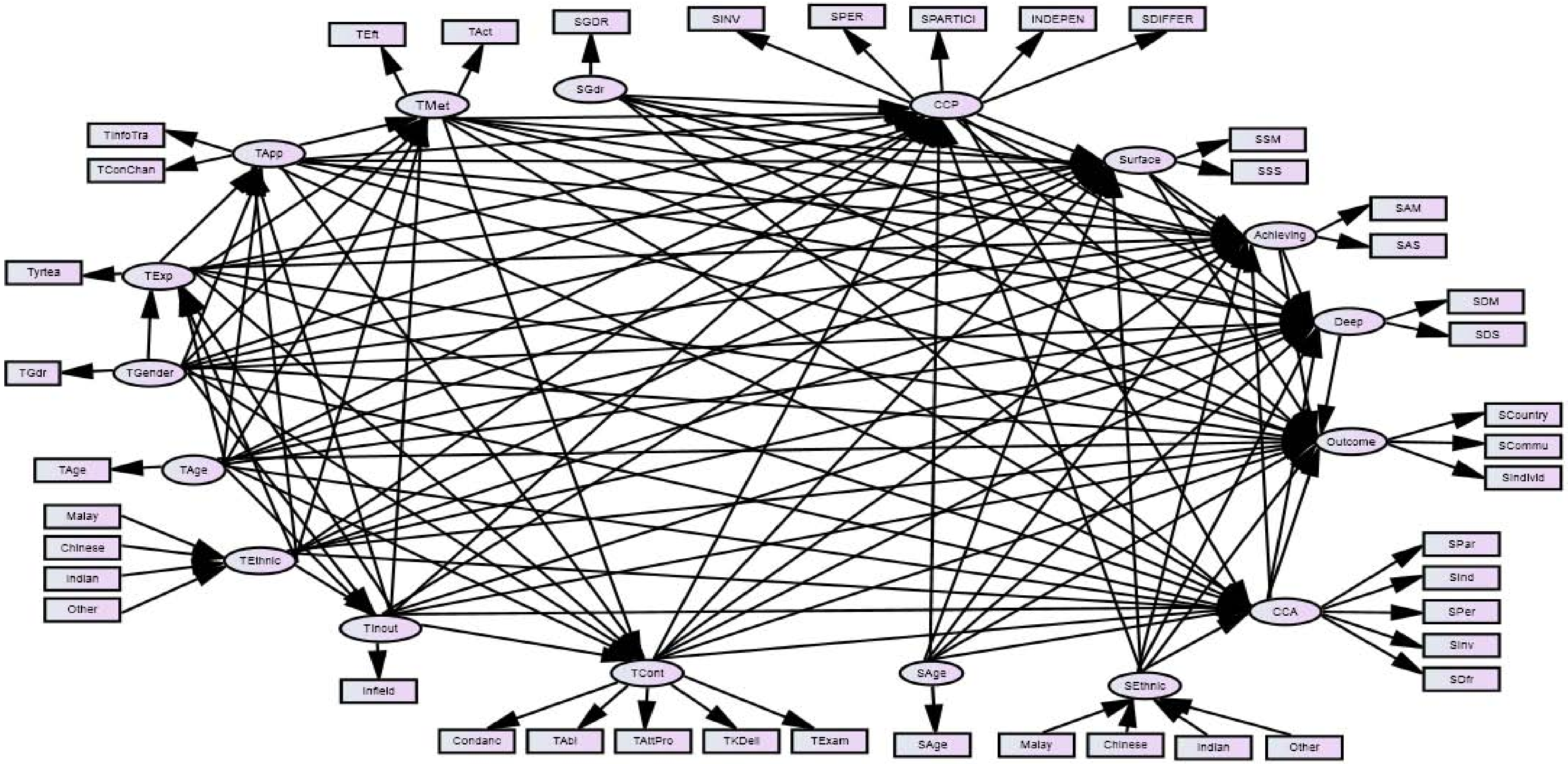

Figure 7. 3 Hypothesised Model for Teachers'Level Model 2

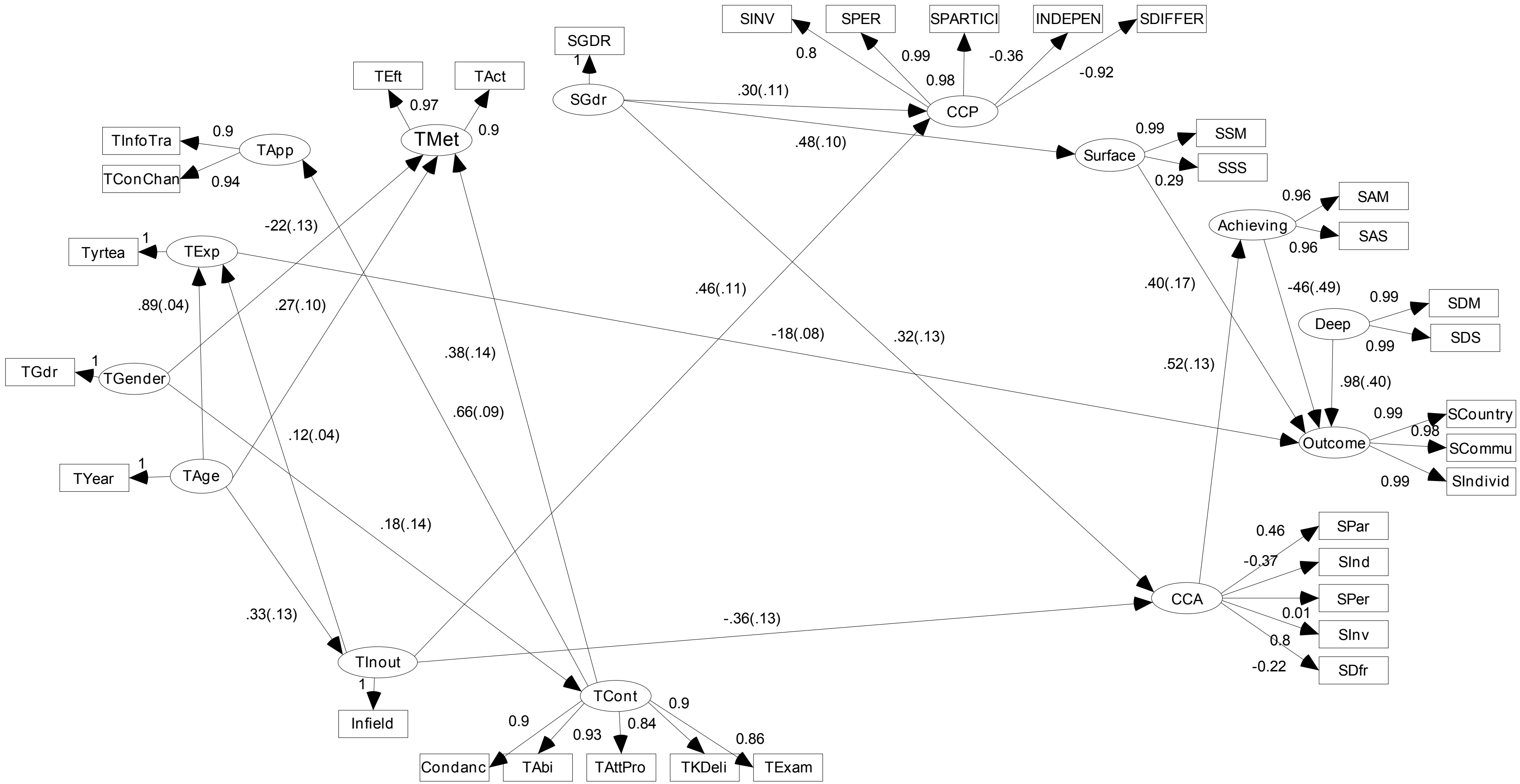

Figure 7. 4 Final Model for Teachers' Level Model 2

The difference between Teachers' level Model 1 and Model 2 relates to the representation of the 'Learning Approaches' variable; In Model 1, all these variables were combined into one student learning approach 'SLearning' In Model 2, the 'Learning Approaches' variables were represented as separate variables: surface motive, deep motive, achieving motive, surface strategy, deep strategy, achieving strategy. The results of the PLSPATHS analysis are discussed in the rest of the chapter.

7.4 Outer Model–Teachers' Level Models 1 & 2

The outer model or measurement model indicates the relationships between the latent variables and the manifest variables. These relationships have three possible modes (types): (1) formative mode, (2) reflective mode and, (3) unity mode (Darmawan, 2003, Rintaningrum et al., 2009). Any manifest variable that does not contribute to the formation or reflection of a latent variable needs to be removed from the further analyses. In PLSPATH, 'PATTERN' is the command line that refers to the relationship between latent variables and their manifest variables.

Despite having many advantages as discussed earlier, PLSPATH also has a few limitations. One of the limitations, claimed by Darmawan (2003, p. 810), is 'the lack of any test of significance'. However, Sellin (1989) suggested that jackknife methods which provide the estimate of the standard error could be used as a test of significance for the results. Furthermore, Sellin (1989) suggested the use of the 'Stone-Geisser' test which predicts relevance. This test, 'basically produces jackknife estimates of residuals variances while jackknife standard errors of points estimates can be obtained as by-products. The general idea is to omit one case at time, to re-estimate the model parameters on the basis of the remaining cases, and to reconstruct or predict omitted case values using the re-estimated parameters' (Sellin,1989, p.262).

In the PLSPATH analysis, five coefficients are used as indicators to delete a manifest variable from a latent construct. The five indices are: (1) weight, (2) loadings, (3) communality, (4) redundancy, and (5) tolerance. The fit indices for teachers' Models 1 and 2 are presented in Table 7.3. The discussion of the results is based on these indices.

The weight indices are the strength of the regression relationships between LVs and MVs in the inward or formative mode. Relationships between LVs and MVs are considered meaningful if the values of the associated weight are equal to or greater than 0.10 (Sellin & Keeves, 1997). Where a weight of zero is recorded, the MV acts as a reference in the use of dummy variables for regressions analyses. In this study there were initially two inward mode latent variables, namely TEthnic and SEthnic. Since the LVs for TEthnic in both models showed no relationship with other constructs. In other words, there were no unidirectional arrows pointed towards the variables, showing that there were no causal relationships between the LVs and MVs. Therefore, it was removed from both models. In the case of SEthnic, the results led to its deletion in Model 2, since it had no significant on other constructs, however, the variable of SEthnic was found to have a significant effect on the 'Learning' construct in Model but justified it being retained in Model 1. Another criteria on, used for the outer model indices, is factor loading. Factor loading indicates the strength of factor analytic relationships between MVs and LVs in the outward or reflective mode (Sellin & Keeves, 1997). There were seven outward (reflective) mode latent variables in this model. A value equal to or larger than 0.40 is considered an adequate factor loading value (Sellin & Keeves, 1997).

Negative loadings indicate that the corresponding manifest variables (MVs) are in the opposite direction on the scale, compared to the MVs that have positive loadings. Negative loadings indicated that the corresponding manifest variables (MVs) are in the opposite direction on the scale, compared to the MVs that have positive loadings. Communality indicates the strength of the outer model and is calculated as the squared correlation between MVs and their associated latent variables (Sellin, 1989). Falk (1987) claimed that the strength of the outer model is measured by the average of the communality values. He added that, if the communality values are greater than 0.30, the values are considered as significantly strong. The higher the average for the communality index, the better the outer model (Falk, 1987). Redundancy indicates the joint predictive power of inner model and outer model relationships as estimated for a given data set (Sellin, 1989). Tolerance indicates the possible multicollinearity within the corresponding block of MVs. Tolerance is calculated as the squared correlation between a given MV and the remaining MVs belonging to the same LV (Sellin, 1995). It is commonly accepted (Sellin, 1989) that if the tolerance value is 0.50 or higher, it can be considered that adequate multicollinearity exists within the block of MVs. According to Darmawan (2003), tolerance indicates the possibility of seriously damaging multicollinearity within the corresponding block of MVs. However these effects can be considered to damage the inward (formative) mode rather than the outward (reflective) mode. In this recent study, the multicollinearity was strong for the block with outward mode, but not for the block with the inward mode, as expected. In the outward mode, all MVs are expected to be highly correlated to one another, in contrast to the inward mode in which low correlations among MVs are expected.

Table 7. 3 Indices for the Outer Model – Teachers' Level Model 1 and Model 2

		MODEL 1					MODEL 2				
Variables	**Mode**	**W**	**L**	**C**	**R**	**T**	**W**	**L**	**C**	**R**	**T**
TAGE/Tyears	unity	1	1	1	0	0	1	1	1	0	0
TGENDER/TGdr	unity	1	1	1	0	0	1	1	1	0	0
TInout	unity	1	1	1	0	0	1	1	1	0	0
TExp	unity										
Tyrteac		1	1	1	0	0	1	1	1	0	0
TApp	outward										
TInfoTra		0.45	0.90	0.82	0.36	0.52	0.45	0.90	0.82	0.36	0.52
TConChan		0.62	0.94	0.90	0.40	0.52	0.62	0.94	0.90	0.40	0.52
TMet	outward										
TEft		0.67	0.97	0.93	0.29	0.59	0.67	0.97	0.93	0.29	0.59
TAct		0.40	0.90	0.82	0.25	0.59	0.40	0.90	0.82	0.25	0.59
TCont	outward										
TExam		0.27	0.86	0.74	0.02	0.61	0.27	0.86	0.74	0.02	0.61
TKDeli		0.23	0.90	0.81	0.03	0.72	0.23	0.90	0.81	0.03	0.72
TAttPro		0.16	0.84	0.70	0.02	0.66	0.16	0.84	0.70	0.02	0.66
TAbiDev		0.25	0.93	0.86	0.03	0.78	0.25	0.93	0.86	0.03	0.78
ConDance		0.23	0.89	0.81	0.03	0.75	0.23	0.89	0.81	0.03	0.75
Sage/ years	unity	1	1	1	0	0					
SGender /sex	unity	1	1	1	0	0					
SEthnic	inward										
Malay (D)		0	0	0	0	0					
Chinese		0.96	0.99	0.97	0.00	0.06	0.96	0.99	0.97	0.00	0.06
Indian		0.18	0.35	0.12	0.00	0.05	0.18	0.35	0.12	0.00	0.05
Other		-0.04	0.17	0.03	0.00	0.05	-0.04	0.17	0.03	0.00	0.05
SCCA	outward										
SPar		0.91	0.94	0.89	0.16	0.60	0.91	0.94	0.89	0.16	0.60
Sind		0.06	-0.46	0.21	0.04	0.44	0.06	-0.46	0.21	0.04	0.44
SPer		-0.17	0.01	0.64	0.12	0.69	-0.17	0.01	0.64	0.12	0.69
SInv		0.27	0.80	0.64	0.12	0.68	0.27	0.80	0.64	0.12	0.68
SDfr		0.22	-0.22	0.05	0.01	0.32	0.22	-0.22	0.05	0.01	0.32
SCCP	outward										
SINV		0.20	0.80	0.64	0.19	0.83	0.20	0.80	0.64	0.19	0.83
SPER		0.29	0.99	0.98	0.30	0.99	0.29	0.99	0.98	0.30	0.99
SPARTICI		0.27	0.98	0.95	0.28	0.99	0.27	0.98	0.95	0.28	0.99
SINDEPEN		-0.17	-0.36	0.13	0.04	0.65	-0.17	-0.36	0.13	0.04	0.65
SDIFFER		-0.25	-0.92	0.85	0.25	0.89	-0.25	-0.92	0.85	0.25	0.89
SOutcome	outward										
SCountry		0.33	0.99	0.97	0.74	0.94	0.33	0.99	0.97	0.74	0.94
SCommunity		0.34	0.98	0.97	0.74	0.93	0.34	0.98	0.97	0.74	0.93
SIndividual		0.34	0.99	0.99	0.75	0.96	0.34	0.99	0.99	0.75	0.96
SLearning	outward										
SSM		0.22	0.87	0.76	0.31	0.97					
SSS		0.03	0.07	0.001	0.002	0.80					
SAM		0.23	0.98	0.95	0.39	0.98					
SAS		0.20	0.94	0.89	0.36	0.99					
SDM		0.23	0.97	0.94	0.38	0.99					
SDS		0.20	0.93	0.87	0.35	0.99					
Surface	outward										
SSM							1.02	0.99	0.99	0.99	0.12
SSS							-0.07	0.29	0.08	0.08	0.12
Achiev	outward										
SAM							0.51	0.96	0.93	0.25	0.73
SAS							0.52	0.96	0.93	0.25	0.73
Deep	outward										
SDM							0.52	0.99	0.97	0.00	0.90
SDS							0.49	0.99	0.97	0.00	0.90

Notes: W =Weight, L= Loadings, C= communality, R= Redundancy and T= Tolerance

Discussion - Outer Models Model 1 and 2

The discussion below focuses on each of the variables in the outer model of the two Teachers' Level Path diagrams (see Figures 7.1 and 7.2). These two Path diagrams share the same variables, except in the case of the Students' Learning Approaches: SLearning from Path Diagram Model 1 and SURFACE, ACHIEVING and DEEP in Path Diagram Model 2. The discussion of this last variable occurs at the end of the sections.

Teachers Age (TAge)

Teacher' age (TAge) as a latent variable was formed out of a single manifest variable, namely TYear. In the model, the TYear variable was reflected by a single indicator and the value of its loading was 1.00 (unity).

Teachers' Gender (TGender)

Teachers Gender (TGender) was similar reflected by a single indicator namely, TGdr. The value of its loading was 1.00 (unity).

Teacher Qualifications (Tinout)

Teacher in-field and out-of-field teachers (Tinout) was also reflected by a single indicator namely, TInfield. The value of its loading was 1.00 (unity).

Teachers' Experience (Tyrtea)

Teacher experience (TExp) was also reflected by a single indicator namely, Tyrtea. The value of its loading was 1.00 (unity).

Student Age (SAge)

Student age (SAge) as a latent variable was formed out of a single manifest variable., namely SYear. In the model, the SAge variable was reflected by a single indicator and the value of its loading was 1.00 (unity).

Students' Gender (SGender)

Students' Gender (SGender) was also reflected by a single indicator namely, SGdr. The value of its loading was 1.00 (unity)

Students' Ethnicity (SEthnic)

Students' Ethnicity (SEthnic) was formed by four MVs that represent the four ethnic groups the students belong to Malay, Chinese, Indian and Other. In this model, the Malay group was used as a reference point (Dummy). Therefore, the factor weight for Malay was set to 0. The regression weight for the three other groups were 0.99, 0.35 and 0.17, for Chinese, Indian, and other.

Teacher Approaches (TApp)

Teacher Approaches (TApp) was a latent variable which was reflected by only two MVs, namely information transfer or teacher-focused (TInfoTra) and conceptual change or student-focused (TConChan). As an outward latent construct, TApp was strongly reflected by these two MVs, with factor loadings of 0.90 and 0.94.

Teaching Methods (TMet)

Teaching Methods (TMet) construct was also reflected by two MVs namely, teaching effective (TEft) and teaching active (TAct). These two MVs were composite scores calculated using a principal component method. The way in which these MVs were formed is explain Chapter 5. These two MVs had high factor loadings (0.97 and 0.90) indicating that this construct was strongly reflected by the two MVs. Factor loadings were similar for both models.

Teacher Conceptions (TCont)

Five MVs reflected the construct of Teacher Conceptions (TCont), namely Exam preparation (TExam), Knowledge delivery (TKDeli), Attitude promotion (TAttPro), Ability development (TAbiDev) and Conduct guidance (ConDance). The factor loadings which were 0.86, 0.90, 0.84, 0.93 and 0.90 respectively were regarded as moderate to high. These results indicate that all MVS were found to be strong reflectors of the construct.

Students Classroom Climate Actual (SCCA)

Students' Classroom Climate Actual (SCCA) was an outward latent variable reflected by five MVs, namely Student Participation (Spar), Student Independence (Sind), Student Personalisation (SPer), Student Investigation (SInv) and Student Differentiation (SDfr). The factor loadings were 0.94, -0.46, 0.01, 0.80 and -0.22 respectively for both models. These coefficients indicated that the SCCA were strongly reflected by Student Participation (Spar) and Student Investigation (SInv). Personalisation was found to be a very strong reflector of SCCA in the Malaysian context. On the other hand, Investigation and Differentiation had negative coefficients. The negative loadings indicated that the corresponding manifest variables were in the opposite direction on the scale compared to those MVs that had positive loadings. For examples, those classes which were high on Participation and Investigation would have correspondingly low scores for Independence and Differentiation.

Students' Classroom Climate Preferred (SCCP)

Similar to the Classroom Climate Actual, Students' Classroom Climate Preferred (SCCP) was also reflected by five MVs namely Student Investigation (SINV), Student Personalisation (SPER), Student Participation (SPARTICI), Student Independence (SINDEPEN), and Student Differentiation (SDIFFER). The MVs' factor loadings were strong for SINV, SPER, SPARTICI, and SDIFFER (0.80, 0.99, 0.98, and -0.92) and moderate for SINDEPEN (-0.36).

Students' Learning Outcomes (Outcome)

Students' Learning Outcomes (Outcome) was reflected by Student Country (SCountry), Student Community (StudentCommunity), and Student Individual (SIndividual). These three MVs had high factor loadings 0.99, 0.98, and 0.99 respectively for both models. This result indicates that this construct was strongly reflected by the three MVs.

Student Learning (SLearning)

Student Learning (SLearning) was an outward mode latent variable reflected by six MVs, namely Student Surface Motive (SSM), Student Surface Motive (SSM), Student Achieving Motive (SAM), Student Achieving Strategy (SAS), Student Deep Motive (SDM), Student Deep Strategy (SDS). All MVs were strong reflectors of the construct, with loading ranging from 0.07 to 0.98. SAM was found to be the strongest reflector of this construct. This construct is only in Model 1.

SURFACE (Surface)

SURFACE was reflected by only two manifest variables namely, Student Surface Motive (SSM) and Student Surface Strategy (SSS). As an outward latent construct, SURFACE was reflected by these two MVs, with the factor loadings of 0.99 and 0.29 respectively. This construct appeared only in Model 2.

ACHIEVING (Achiev)

In similar manner to SURFACE, ACHIEVING (Achiev) was reflected by two MVs namely, Student Achieving Motive (SAM) and Student Achieving Strategy (SAS). Both MVs were strong reflectors of achieving, with factor loadings of 0.96 and 0.96. This construct also was only in Model 2.

DEEP

DEEP was reflected by only two MVs variables namely, Student Deep Motive (SDM), Student Deep Strategy (SDS). As an outward latent construct, DEEP was strongly reflected by these two MVs, with the factor loadings of 0.99 and 0.99 respectively. This construct appeared only in Model 2.

7.5 Inner Model –Teachers' Level Path Model 1 and 2

The inner or structural model indicates the relationships between one LV regressed on other LVs (Rintaningrum et al., 2009). In PLSPATH version 3.01, these relationships are termed 'MODEL' in the command line. Any paths between the LVs are removed from the further analysis, if the path does not show meaningful and adequate influence (Darmawan, 2003; Rintaningrum et al., 2009). The indicators which are used in the analysis of the inner model to delete or remove the non-significant path (a) regression coefficient (beta), (b) correlation coefficient (r), (c) tolerance, (d) jackknife means (JknMean), and (e) jackknife standard error(JknStd). To check the predictive strength of the inner model, R-squared (R^2) is used.

Beta is the coefficient of the direct effect between one latent variable and another. Sellin (1989) suggested that the beta coefficient is generally acceptable with a value of 0.05 or larger, for a large data set, or 0.10 for a small data set. The jackknife mean is the mean of the path coefficients obtained in each jackknife cycle. The jackknife standard error is the estimated error associated with each path coefficient. Correlation coefficients involve zero-order or product moment correlation coefficients between the given independent (predictor) latent variable and the dependent (criterion) latent variable (Sellin, 1989).

Although, in PLSPATH analysis, a statistically significant test is not provided as part of the results, Darmawan (2003, p. 82), argued that ‘where an estimated coefficient is more than twice the value of its jackknife standard error, the coefficient can be considered to be statistically significant at approximately the five per cent level of probability’.

Sellin and Keeves (1997) suggested that a direct path with a coefficient of $\beta<0.10$ could be deleted because such a value indicated a less meaningful effect on the estimation of the relationship between the two LVs. In fact, the greater the β value, the greater is the effect on the path model. For this study the process was continued until all inadequate paths were removed. Table 7.4 presents the remaining path indices for the inner model in relation to Model1 and 2.

Table 7. 4 Path Indices for PLS Inner Model – Model 1 and Model 2

	MODEL 1					MODEL 2				
Variable	**Beta**	**JknMean**	**JknStd**	**Corr**	**Tolerance**	**Beta**	**JknMean**	**JknStd**	**Corr**	**Tolerance**
Teacher in-field/out-of field (TINOUT)										
Teacher Age (TAGE)	0.33	0.33	0.13	0.33	0.00	0.33	0.33	0.13	0.33	0.00
Teaching Conception (TCONCEPT)										
Teacher Gender (TGENDER)	0.18	0.18	0.14	0.18	0.00	0.18	0.18	0.14	0.18	0.00
Teacher Approaches (TAPPROAC)										
Teacher Conception (TCONCEPT)	0.66	0.66	0.10	0.66	0.00	0.66	0.66	0.10	0.66	0.00
Teaching Method (TMETHOD)										
Teacher Gender (TGENDER)	0.22	0.22	0.13	0.27	0.04					
Teacher Age (TAGE)	0.27	0.27	0.10	0.28	0.02					
Teacher Conception (TCONCEPT)	0.38	0.38	0.14	0.45	0.04	0.26	0.26	0.18	0.46	0.43
Teacher Approaches (TAPPROAC)						0.30	0.30	0.19	0.48	0.43
Teacher Year of Teaching (TEXP)										
Teacher Age (TAGE)	0.89	0.89	0.04	0.93	0.11	0.89	0.89	0.04	0.93	0.11
Teacher in-field/out-of field (TINOUT)	0.12	0.12	0.06	0.41	0.11	0.12	0.12	0.06	0.41	0.11
Classroom Climate Preferred (CCP)										
Teacher in-field/out-of field (TINOUT)	0.46	0.46	0.11	0.45	0.05	0.46	0.46	0.11	0.45	0.05
Student Gender (SGENDER)	0.30	0.30	0.11	0.30	0.05	0.30	0.30	0.11	0.30	0.05
Classroom Climate Actual (CCA)										
Teacher in-field/out-of field (TINOUT)	-0.35	-0.35	0.13	-0.37	0.05	-0.35	-0.35	0.13	-0.37	0.05
Student Gender (SGENDER)	0.32	0.32	0.13	0.24	0.05	0.32	0.32	0.13	0.24	0.05
Students' Perception of History Learning (SOUTCOME)										
Student Learning Approaches (LEARNING)	0.84	0.84	0.05	0.86	0.11					
Teacher Year of Teaching (TEXP)	0.18	0.18	0.08	0.26	0.11					
Surface Learning Approaches (SURFACE)						0.40	0.40	0.17	0.74	0.86
Achieving Learning Approaches (ACHEIV)						-0.46	-0.46	0.49	0.85	0.98
Deep Learning Approaches (DEEP)						0.98	0.98	0.40	0.85	0.96
Student Approaches to Learning (SLEARNING)										
Student Gender (SGENDER)	0.34	0.34	0.12	0.44	0.04					
Student Ethnicity (SETHNIC)	-0.48	-0.48	0.10	0.44	0.04					
Surface Learning Approaches (SURFACE)										
Student Gender (SGENDER)						0.39	0.48	0.17	0.48	0.00
Achieving Learning Approaches (ACHIEV)										
Classroom Climate Actual (CCA)						-0.46	0.52	0.49	0.52	0.00

Table 7. 5 Summary of Direct, Indirect and Total Effects for the Inner Model – Model 1 and Model 2

	MODEL 1				MODEL 2			
Dependent Independent Variables	Direct β	Indirect i	Total β + i	Correlation r	Direct β	Indirect i	Total β + i	Correlation r
TINOUT	$R^2 = 0.11$				$R^2 = 0.11$			
TAGE	0.33	-	0.33	0.33	0.33	-	0.33	0.33
TCONCEPT	$R^2 = 0.32$	-			$R^2 = 0.32$			
TGENDER	0.18	-	0.18	0.18	0.18	-	0.18	0.18
TAPPROAC	$R^2 = 0.44$				$R^2 = 0.44$			
TGENDER	-	0.12	0.12	0.24	-	0.12	0.12	0.24
TCONCEPT	0.66	-	0.66	0.66	0.67	-	0.67	0.67
TMETHOD	$R^2 = 0.30$				$R^2=0.27$			
TGENDER	0.22	0.07	0.29	0.26	-	0.08	0.08	0.26
TAGE	0.27	-	0.27	0.28				
TCONCEPT	0.38	-	0.38	0.45	0.26	0.20	0.46	0.46
TAPPROAC					0.30	-	0.30	0.48
CCP	$R^2 = 0.30$				$R^2 = 0.30$			
TAGE	-	0.15	0.15	0.54	-	0.15	0.15	0.54
TINOUT	0.46	-	0.46	0.45	0.46	-	0.46	0.45
SGENDER	0.30	-	0.30	0.29	0.30	-	0.30	0.29
CCA	$R^2 = 0.19$				$R^2 = 0.19$			
TAGE	-	-0.12	-0.12	-0.13	-	-0.12	-0.12	0.13
TINOUT	-0.35	-	-0.35	-0.36	-0.35	-	-0.35	-0.35
SGENDER	0.32	-	0.32	0.24	0.32	-	0.32	0.24
TEXP	$R^2 = 0.87$				$R^2 = 0.87$			
TAGE	0.89	0.04	0.93	0.93	0.89	0.04	0.93	0.93
TINOUT	0.12	-	0.12	0.41	0.12	-	0.12	0.41
SOUTCOME	$R^2 = 0.76$				$R^2 = 0.78$			
TAGE	-	0.16	0.16	0.28	-	0.16	0.16	0.28
TINOUT	-	0.02	0.02	-0.01	-	0. 03	0.03	-0.01
SGENDER	-	0.28	0.28	0.40	-	0.28	0.28	0.40
SETHNIC	-	-0.40	-0.40	-0.51				
LEARNING	0.84	-	0.84	0.86				
TEXP	0.18	-	0.17	0.27	0.17	-	0.17	0.27
CCA					-	-0.24	-0.24	0.52
SURFACE					0.40	-	0.40	0.74
ACHIEV					-0.46	-	-0.46	0.85
DEEP					0.98	-	0.98	0.85
LEARNING	$R^2 = 0.41$							
SGENDER	0.34	-	0.34	0.44				
SETHNIC	-0.47	-	-0.48	-0.55				
SURFACE					$R^2 = 0.24$			
SGENDER					0.39	-	0.39	0.39
ACHIEV					$R^2 = 0.27$			
TAGE					-	-.0.01	-0.01	0.12
TINOUT					-	-0.03	-0.03	-0.10
SGENDER					-		0.17	0.40
CCA					-0.46	-	-0.46	-0.46

The path indices for Model 1 and Model 2 are shown in Table 7.4. All the paths included in these models had beta coefficients that larger than 0.10. These results indicated that the beta coefficients for the inner model in this study were acceptable. On the other hand, most of the values of tolerance were less than 0.50, but there were four variables with tolerance coefficients of more than 0.50. These results indicated that this model had a moderate degree of multicollinearlity. The next section describes the effects of the Latent Variable involved in the paths model analysis on the endogenous and exogenous variables in the Teachers Level Path Model 1 and 2.

The Effect ON the variable in the Inner Model- Teachers' Level Model 1 and 2

This section discusses the inter relationships of the latent variables involves in the path models given in Figure 7.1 and Figure 7.2. The discussion is focussed on both the direct and indirect effects on the path models.

TInout (In-field/ out-of-field teacher) –Teachers' Level Model 1

- $R^2 = 0.11$
- The Teacher Age (TAge) effect on TInout (β = 0.33, SE= 0.13)

The R^2 value for TInout was 0.11, which indicated that teacher's age explained 11% of the variance of TInout. The results show that only teacher age had a direct effect on TInout.

It was found that there was a positive relationship/inference between teachers' age and teachers' qualifications which indicated that the older the History teachers were the more likely they were to have relevant qualifications to teach History.

TExp (Year of Teaching)

The teacher's year of teaching (TExp) effect on

- $R^2 = 0.87$
- Teacher Age (TAge) effect on TExp (β = 0.89, SE= 0.04)
- TInout (In-field/out-of-field History teacher) effect on TExp (β = 0.12, SE= 0.04)

The R^2 value for the TExp was 0.87, indicating that the path model explained 87% of the variance of TExp. Two factors were found to have a positive direct effect on TExp; namely Teacher age (TAge) and TInout (In-field/out-of-field History teacher). The teachers' age as expected is strongly associated with their experience. This means that the older teachers in general were more experienced compared to their younger counterparts. In addition, this variable had a small indirect effect on teachers' experience (i= 0.04) through teaching qualification.

The results also showed that in-field History teachers in general had a positive direct effect on teacher experience, implying that they were more experienced History teachers compared to out-of-field History teachers.

TCont (Teaching Conceptions)

- $R^2 = 0.32$
- Teacher Gender (TGender) effect on TConcept (β = 0.18, SE= 0.14)

The R^2 value for the TCont was 0.32, indicating that the path model explained 32% of the variance of TCont The TGender was the only factor that was found to have a direct effect on TCont.

The result indicated that female History teachers had stronger teaching conceptions towards History teaching in the classroom compared to male teachers. Of the five types of teaching conceptions involved in this study, Condance (0.90), AbiDev (0.93), AttPro (0.84), KDeli (0.9), and ExamPre (0.86), Female teachers were more concerned about conduct guidance (ConDan), ability development (AbiDev), knowledge delivery (KDeli) and exam preparation (ExamPre) compared to their male counterpart.

TApp (Teaching Approaches)

- $R^2 = 0.44$
- Teacher Conceptions(TCont) effect on TApp (β = 0.66, SE= 0.09)

The R^2 value for the TApp was 0.44, indicating that the TCont explained 44% of the variance of TApp. The TCont was the only factor that was found to have a positive direct effect on TApp. Additionally, there was an indirect effect from TGender (i=0.12).

There was a positive relationship between Teacher Conceptions and teaching approaches. The teaching approaches in this study were reflected by two manifest variables included in the model. They were: (a) the Information transfer or teacher-focused (TInfoTra) (0.90), and (b) conceptual change or student-focused (TConChan) (0.95). The results indicated that those History teachers who had higher level of teaching conceptions were more likely to to have a strong approach to teaching through information transfer or conceptual change.

Table 7.4 showed the results of indirect effects of the latent variable that influenced teaching approaches (TApp). The indirect effect of the gender on TApp through TCon is 0.12. The analysis showed that females in general, who had stronger teaching conceptions, also had stronger approaches to teaching.

TMet (Teaching Methods)

- $R^2 = 0.30$
- Teacher Gender (TGender) effect on TMet (β = 0.22, SE= 0.13)
- Teacher Age (TAge) effect on TMet (β = 0.27, SE= 0.10)
- Teacher teaching Conception (TCont) effect on TMet (β = 0.38, SE= 0.14)

The R^2 value for the TMet was 0.30, which indicates that TGender, TAge, and TCont explained 30% of the variance of TMet. Three factors were found to have direct effects on TMet.

The three variables (TGender, TAge and TCont) all had positive relationships with the teaching methods. The results showed that female History teacher's employed higher level of teaching methods in terms of effective and active teaching methods. In addition to its direct effect, gender is also found to influence teaching methods indirectly through Teaching Conceptions (i=0.07).

The results also indicated that older History teachers were more likely to adopt effective and active teaching methods in the classroom. Such teachers were also more likely to have a strong conceptions of teaching in the History classroom.

CCP (Classroom Climate Preferred)

- $R^2 = 0.30$
- TInout (In-field/out-of-field History teacher effect on SCCP) ($\beta = 0.46$, SE= 0.11)
- Student Gender (SGender) effect on SCCP) ($\beta = 0.30$, SE= 0.11)

The R^2 value for the CCP was 0.30, which indicated that TInout and SGender explained 30% of the variance of CCP. There were two factors that were found to have direct effects on CCP was namely, TInout (0.46) and SGender (0.30). In addition to these direct effects, CCP also indirectly effected by TAge (i = 0.15).

The direct relationship between Tinout and CCP, indicated that in-field History teachers were more likely to teach in classrooms where on average, students preferred an environment that had a high level of personalization, participation, and independence, but a low level of investigation, and differentiation.

The results also showed that classrooms which on average, had a higher proportion of girls were more likely to prefer a higher level of personalisation (0.99), participation (0.98), and investigation (0.80) but less investigation (-0.36), and differentiation (-0.92) as their preferred classroom climate.

In relation to indirect effects, the path model (see Figure 7.1) showed classroom climate preferred (CCP) was also influenced indirectly by teacher age (TAge) (0.15) through the in-field/out-of-field construct. As mentioned earlier, older teachers, who are more likely to be in-field History teachers, tended to have classes where students, on average, wanted personalisation (0.99), participation (0.98), and investigation (0.80) as opposed to independence (-0.36), and differentiation(-0.92) as their preferred classroom climate.

CCA (Classroom Climate Actual)

- $R^2 = 0.19$
- TInout (In-field/out-of-field History teacher effect on CCA) ($\beta = -0.35$, SE= 0.13)
- Student Gender (SGender) effect on CCA) ($\beta = 0.32$, SE= 0.13)

The R^2 value for the CCA was 0.19, indicated that the model explained 19% of the variance of CCA. There were two factors that were found to have direct effect on CCA namely, a) TInout and b) Student Gender.

The results showed a negative relationship between TInout and CCA. This negative association indicated that in-field History teachers were more likely to have classes in which, on average, students experienced independence (-0.37), and differentiation (-0.22) but less personalized, participatory and investigative activities, in their History classroom. In contrast the results showed a positive relationship between SGender and CCA. This result indicated that students' in classrooms that had higher proportion of girls were more likely to experienced more investigation (0.08), participation (0.94), and personalisation (0.01) in their learning activities but less independence, and differentiation compared to History classes that had more boys.

In addition to these direct effects, teacher age was found to have an indirect effect on the actual classroom climate (CCA). The results revealed a significant negative relationships betweenTAge (-0.12) and CCA through the in-field/out-of-field construct. Older teachers, who were more likely to be in-field History teachers, tended to have classes in which, on average, students in the actual History classroom were likely to have experienced independence (-0.37), and differentiation (-0.22), but not personalization, participation and investigation.

The Effect ON the variable in the Inner Model- Teacher Level Model 1

The section discusses variables in the inner model which had an effect on students' approaches to learning as it was set up in Model 1, where all learning approaches were combined into a single variable SLearning.

Student Approaches to Learning (SLearning)

- $R^2 = 0.41$
- Student Gender (SGender) effect on Learning ($\beta = 0.34$, SE= 0.12)
- Student Ethnicity (SEthnic) effect on Learning ($\beta = -0.47$, SE= 0.09)

The R^2 value for the Learning was 0.41, which indicated that the model explained 41% of the variance of students' approaches to learning. Student gender (0.34) and SEthnic were found to have direct effects on Learning. There were six manifest variables which reflect students' approaches to learning: (1) deep motive, (2) deep strategy, (3) surface motive, (4) surface strategy, (5) achieving motive and (3) achieving strategy.

Results showed that on average, students in classrooms that had more girls and non-Chinese students were more likely to adopt higher order learning approaches. (i.e. Achieving or deep).

Students' Perception of History Learning Objectives (SOutcome)

- $R^2 = 0.76$
- Student Approaches to Learning (SLearning) effect on Outcome ($\beta = 0.84$, SE= 0.05)
- Teacher Year of Teaching (TExp) effect on Outcome ($\beta = 0.18$, SE= 0.08)

The R^2 value for the SOutcome was 0.76, indicating that the model explained 76% of the variance of SOutcome. Two variables were found to have a direct effect on students' perceptions of History learning objectives (SOutcome) namely, SLearning and teacher year of Teaching (TExp). In addition to these direct effects SOutcome was also influenced indirectly by TAge (i = 0.16), TInout (i = 0.02), SGender (i = 0.28) and SEthnic (i = -0.40).

SLearning and TExp had positive effects on SOutcome. This result indicated that students in the classes where, on average, employed deep and achieving approaches, were more likely to have positive perceptions of History learning outcomes (SOutcomes).

In addition, those students taught by experienced History teacher were more likely to perceive that they had achieved the History learning outcomes.

Indirect Effects on students' learning outcomes were evident in the case of the following four factors:

- Teacher Age (TAge) (i = 0.16) on Outcome
- Teacher In-field/ out-of-field (TInout) (i = 0.02) on Outcome
- Student Gender (SGender) (i = 0.28) on Outcome
- Student Ethnicity (SEthnic) (i = -0.40) on Outcome

The results revealed positive effects of these variables, except for SEthnic (-0.40). Girls as well students under older and in-field History teachers had stronger perceptions that the History lessons have met their objectives compared to those Boys as well as students under the out-of-field and younger History teachers.

SEthnicity variable (-0.40) had negative indirect effects on the students' learning outcomes in History learning. The results showed that non-Malay students such as Chinese students' were more less likely to perceived that History learning has met its objectives.

The Effect ON the variable in the Inner Model- Teachers' Level Model 2

This section discusses the variable in the inner model which had an effect on students' approaches to learning as it was set up in Model 2. Only two of the students' approaches to learning variables showed significant results. There were no significant results on the Deep approach to learning.

SURFACE (Surface Learning Approaches)

- R^2 = 0.24
- Student Gender (SGender) effect on SURFACE (β = 0.39, SE= 0.17)

The R^2 value for the SURFACE was 0.24, indicates that the model explains 24% of the variance of SURFACE in this model. Student gender (0.49) was found to have a direct effect on SURFACE.

There was a positive relationship between students' gender and students learning approaches in History learning. Results showed that students in classrooms with a higher proportion of girls were more likely to adopt a surface learning approaches compared to students in classrooms that had more boys.

ACHIEV (Achieving Learning Approaches)

- $R^2 = 0.27$
- Classroom Climate Actual (CCA) effect on ACHIEV ($\beta = -0.46$, SE= 0.49)

The R^2 value for the ACHIEV was 0.27, which indicated that the Model 2 explained 27% of the variance of ACHIEV. Classroom Climate Actual (CCA) was found to have direct effect on ACHIEV.

Results showed a positive relationship between CCA and ACHIEV. This indicated that students in a classroom in which they experienced high levels of participation, personalisation, and investigation but lower levels of independence and differentiation were more likely to adopt the achieving learning approach in the classroom.

Three variables were found to have an indirect effect on ACHIEV:

- Teacher Age (TAge) (i = -0.01) on ACHIEV
- TInout (In-field/out-of-field History teacher) (i = -0.03) effect on ACHIEV

The two variables, TAge and TInout, showed negative effects toward the ACHIEV.

The results from the TInout (-0.01) variable revealed that, on average, students under an in-field History teacher are less likely to adopt an achieving approach to learning in the classroom compared to students under an out-of-field History teacher. The negative relationship between ACHIEV and TAge means that, on average, students under older teachers were less likely to adopt the achieving approach.

Students Perception of History Learning Objective (SOutcome)

- $R^2 = 0.78$
- Surface Approaches to Learning (SURFACE) effect on SOutcome (β = 0.40, SE= 0.17)
- Achieving Approaches to Learning (ACHIEV) effect on SOutcome (β = - 0.46, SE= 0.49)
- Deep Approaches to Learning (DEEP) effect on SOutcome (β = 0.98, SE= 0.40)
- Teachers' Year of Teaching (TExp) effect on SOutcome (β = 0.18, SE= 0.08)

The R^2 value for the SOutcome was 0.78, which indicated that the model explained 78% of the variance of SOutcome Four variables were found to have a direct effect on students' perceptions of History learning (SOutcome).

The results showed that the deep approach to learning was strongly influencing SOutcomes. In other words, students who employed the DEEP approach to learning were more likely to have higher levels of appreciation of learning History. A similar relationship was also found between teacher experience and SOutcome. Students taught by experienced teachers were likely to have higher levels of appreciation toward learning History, such as practising moral values, enhancing maturity and individual thinking ability (0.99), as well as appreciating the efforts and the contributions of individuals who struggle for independence and development of the country (0.97), and for the community (0.97) in general. However, students who employed ACHIEVE approach to learning showed to lower levels of appreciation of the learning History objectives in terms of individual, country and community.

The results indicated that the students' view of History learning (SOutcome) was indirectly influenced by three factors

- Teacher Age (TAge) (i = 0.16)
- Teacher In-field/ out-of-field (TInout) (i = 0.03)
- (SGender) (i = 0.12)
- Classroom Climate Actual (CCA) (i = -0.24)

Teachers' age and qualifications have indirect effects on the students' perceptions of History learning (SOUTCOME). Girls as well as students under older teachers, who were the in-field History teachers, were more likely to perceive that the History lesson have met their objectives of learning History such as practising moral values, and enhancing maturity and the thinking ability individuals (0.99), as appreciating the efforts and the contributions of individuals who struggled for independence and development of the country (0.97) and community (0.99), compared to boys and students under the younger out-of-field History teachers.

CCA (-0.24) had an indirect negative effect on SOutcome. The result indicated that students who experienced participation, personalisation and innovation in their classroom were more likely to perceive that the objectives of learning History had been achieved.

7.6 Summary of Analysis Teachers' Level Path– Models 1 and 2

There were two teachers' level path models which were examined in this chapter. In the first model (Model 1) students' learning approaches were combined into a single variable as 'SLearning' (refer to Figure 7.1) In the second model (Model 2) the Learning Approache variables were discussed as six separate variables surface motive, deep motive, achieving motive, surface strategy, deep strategy, achieving strategy (refer to Figure 7.2). Apart from this one variation the 2 path models had identical variables.

In this research PLSPATH analysis was carried out to investigate the possible relationships which could help to answer the three major research questions as advanced in Chapter 2. These relationships were between teachers' characteristics (age, gender, ethnicity, teacher in-field and out-of-field, and teacher experience), teaching conception, teacher approaches, teaching methods, and students' characteristics (age, gender, ethnicity), classroom environment (Preferred and Actual), approaches to learning (Surface, Achieving and Deep) and students' perceptions of History learning outcomes in the classroom. The main relationships revealed in the PLSPATH analyses are discussed below.

(a) For Conceptions of teaching, the results indicated that teacher gender had a positive relationship with teaching conceptions. This result meant that female History teachers had higher teaching conceptions compared to the male History teachers.

(b) In the case of Teaching approaches to teaching, the results revealed that there was a positive relationship between Teaching conceptions and Teaching approaches This meant that those History teachers who had higher teaching conceptions were more likely to employ both teaching approaches information transfer or teacher-focused and conceptual change or student-focused. The analysis also revealed that female teachers who in general, had stronger teaching conceptions also had stronger teaching approaches.

(c) In relation to Teaching methods, the results showed positive relationships with teaching conceptions and teaching approaches, as well as gender and age. The results showed that female History teachers were more likely to employ higher level of teaching methods in terms of being both effective and active. The results also indicated that as their age increased History teachers were more likely to adopt effective and active teaching methods in the classroom. In other words, older female teachers were more likely to apply higher levels of teaching conceptions in the History classroom.

(d) For Teaching experience (years of teaching), the results indicated a positive relationship with two variables, teachers' age and teacher TInout ('in-field' and 'out-of-field') History teachers. This meant that the more experienced teachers were more likely to be older and to be in-field History teachers than their younger counterparts.

(e) Preferred Classroom Climate had a positive relationship with teacher TInout ('in-field' and 'out-of-field') History teachers and students' gender. These results indicated that students under in-field History teachers, or in a class with a high proportion of girls were more likely to prefer an environment that had higher levels of personalization, participation, and independence, but lower levels of investigation, and differentiation.

(f) Classroom Climate Actual had a negative relationship on teacher TInout, while having a positive relationship with the students' gender. The negative association indicated that in-field History teacher were more likely to have classes in which, on average, students were likely to experience more independent, participative, and differentiative activities but less personalized, and investigative activities, in their History classroom. However, this result is in contrast, to the negative relationship between student gender and Classroom Climate Actual.

(g) For Student Approaches to Learning, the results showed that on average, students in classrooms that had more girls were more likely to adopt high order learning approaches. There was also a negative relationship between Student Ethnicity and Learning. The implications were that Malay (D) students were more likely to adopt high order learning approaches followed by Other ethnic, Indian, and Chinese backgrounds.

(h) With Surface Learning Approaches, the results indicated a positive relationship with student gender. Classrooms with a high proportion of girls were more likely to adopt surface learning approaches, compared to students in classrooms that had more boys.

(i) Achieving Learning Approaches had a positive relationship with Actual classroom climate. This result indicated that when students were in the classroom in which they have higher levels of participation, personalisation, and investigation but lower level of independent and differentiation, they were more likely to adopt achieving learning approaches in the classroom.

(j) Students, Perceptions of History learning (SOutcomes), showed a positive relationship with surface and deep approaches, to learning and also with the teacher experience. However, there was a negative relationship with achieving approaches. The result indicated that students in classroom in which a high proportion employed of DEEP approach to learning were more likely to appreciate the objectives of learning History. In addition, students taught by experienced teacher were likely to perceive the objectives of learning History. However, students who employed achieving approach to learning were less likely to appreciate the objectives of learning History in the classroom.

In relation to the focus of this study investigation, the differences between out-of-field and in-field teachers in History classrooms in Kuala Lumpur, the path analysis showed an indirect relationship between Teachers' qualification and students' learning outcomes through the variables of Teachers Experience. However, one of the most important findings in both Path Analysis Models was the absence of any direct relationship between the teacher qualification variables (out-of-field/ in-field) and Students' History learning outcomes. The implications of this finding are considered in Chapter 10. The following chapter reports the results of the PLSPATH analysis of the student level data.

Chapter 8 Partial Least Squares Path Analysis: Student Level

8.1 Introduction

This chapter discusses the results of the Partial Least Squares Path (PLSPATH) analysis at the students level. The partial least squares path analysis (PLSPATH) program Version 3.01 (Sellin, 1989) was carried out in this study based on the students' data set (1653 students, Year 11). The relationships that have been investigated in this chapter were similar to the previous chapter, which used PLSPATH analysis of teachers' data. The variables investigated were teachers' characteristics (age, gender, ethnicity, teacher in-field and out-of-field, and teacher experience), teacher conceptions, teacher approaches, teaching methods, and students' characteristics (age, gender, ethnicity), classroom climate preferred, classroom climate actual, approaches to learning (Surface, Achieving and Deep approaches), and students' perceptions of History learning (Outcomes) in the classroom. However, this analysis is concerned about the processes occured at the student level.

8.2 Model Building in the PLSPATH analyses

In this chapter, as in Chapter 7, two path models were developed in order to explore the students' level data. In Path Model 1, the latent construct of 'Learning Approaches,' which was reflected by six components, such as surface motive and surface strategy, deep motive and deep strategy, as well as achieving motive and achieving strategy, was represented by a variable given the acronym 'SLearning'. On the other hand, in students, Level Path Model 2, the three components of ' Learning Approaches' were consider as separate latent variables, labelled as 'Surface', 'Achieving' and 'Deep'. Each of these learning approaches was reflected by two manifest variables, labelled as motive and strategy. The other variables in the two Students' Level Path Models were the same. In particular, the outcome variables was the same in both students' Level Path Models: Students' perceptions of the achievement of the History Learning Objectives, which was given the acronym 'SOUTCOME'

AMOS 17 (Arbuckle, 2008) was used to draw the PATH diagrams using the path coefficients based on the PLSPATH results. There were 15 and 17 LVs included in Models 1 and 2 respectively. Overall, there 42 MVs in each of the models. Tables 8.1 and 8.2 exhibit all the variables in Models 1 and 2 that were proposed in this study. The latent variables (LVs) and manifest variables (MVs) are also listed in Table 8.1 and 8.2 according to their acronyms, together with a description of each variable. In addition, the mode of each block, such as unity, inward or outward, is presented.

The interrelationships among the variables in the Student' Level Path Models 1 and 2 are shown in two path diagrams, Figures 8.1 and 8.2 respectively. A path diagram consists of two models; the inner model and the outer model. The inner model, on one hand, consists of relationships among LVs. The outer model, on the other hand, shows the relationships between each LV and its corresponding MVs. Overall, there are 42 MVs in each of the models. There are two types of LVs, namely 1) exogenous (independent) or antecedent variables, which receive no causal input from other variables; and 2) endogenous (dependent) variables, which receive one or more causal inputs from other variables. In Models 1 and 2 the exogenous (independent) variables at the student level are teachers' characteristics such as age, gender, ethnicity, years of teaching experience), and in-field or out-of-field History qualifications, as well students' characteristics such as age, gender, and ethnicity. The endogenous (dependent) variables at the teacher level are teaching approaches, teaching methods and teaching conceptions and for the student level are classroom environment (actual and preferred), learning approaches (Surface, Deep and Achieving).The criterion variable was students' learning History objective (country, community, and individual).

Figures 8.1, Figure 8.2, Figure 8.3 and 8.4 display all the variables involved in these Student Level Path Models. The manifest variables are presented in box shapes while the latent variables are shown as oval shapes. The diagrams present the relations between the teacher and student teaching and learning History in the classroom variables at the students' level. The reports on the relationships are discussed in two part, as they related to the outer (measurement) model, and the inner (structural) model.

The full list of the variables in this study is presented in Tables 8.1 and Table 8.2 in relation to the two Hypothesised Models 1 and 2 labelled Figures 8.1 and 8.2; and the Final Models labelled 1 and 2 as presented in Figures 8.2 and 8.4.

Table 8. 1 Variables in the Student Level Path Model 1

Latent Variable (Acronym)	Mode	Description	Manifest Variables (Acronym)	Description	Coding
TAge	unity	Teacher's age	TYear	Age in years	21-50
TGender	unity	Teacher's gender	TGdr	0=Male 1= Female	0=M 1=F
TEthnic	Inward	Teacher's ethnicity	TMalay	Malay (Dummy)	0=Not Malay 1=Malay
			TChinese	Chinese	0=Not Chinese 1=Chinese
			TIndian	Indian	0=Not Indian 1=Indian
			TOther	Iban/Melanau/Thai	0=Not Other 1=Other
TInout	unity	Teacher's qualification	In-field	In-field/ out of-field	0=Out of-field 1=In-field
TExp	unity	Teacher Years of teaching	Tytea	Teaching experience in History	Raw Scores
TApp	outward	Teaching approaches	TInfoTra	Information Transfer	Factor Scores
			TConChan	Conceptual Change	Factor Scores
TMet	outward	Teaching Methods	TEft	Teaching Effective	Factor Scores
			TAct	Teaching Active	Factor Scores
TCont	outward	Teaching Conception	TExam	Exam Preparation	Factor Scores
			TKDeli	Knowledge Delivery	Factor Scores
			TAttPro	Attitude Promotion	Factor Scores
			TAbiDev	Ability Development	Factor Scores
			ConDance	Conduct Guidance	Factor Scores
SAge	unity	Student's age	SYear	Age in years	17-18
SGender	unity	Student's gender	SGdr	0=Male 1= Female	0=M 1=F
SEthnic	Inward	Student's ethnicity	TMalay	Malay (Dummy)	0=Not Malay 1=Malay
			TChinese	Chinese	0=Not Chinese 1=Chinese
			TIndian	Indian	0=Not Indian 1=Indian
			TOther	Iban/Melanau/Thai	0=Not Other 1=Other
SCCA	outward	Classroom Climate Actual	Spar	Participation	Factor Scores
			Sind	Independence	Factor Scores
			SPer	Personalisation	Factor Scores
			SInv	Investigation	Factor Scores
			SDfr	Differentiation	Factor Scores
SCCP	outward	Classroom Climate Preferred	SINV	Investigation	Factor Scores
			SPER	Personalisation	Factor Scores
			SPARTICI	Participation	Factor Scores
			SINDEPEN	Independence	Factor Scores
			SDIFFER	Differentiation	Factor Scores
SLearning	outward	Student's Approaches to Learning	SSM	Surface Motive	Factor Scores
			SSS	Surface Strategy	Factor Scores
			SAM	Achieving Motive	Factor Scores
			SAS	Achieving Strategy	Factor Scores
			SDM	Deep Motive	Factor Scores
			SDS	Deep Strategy	Factor Scores
SOutcome	outward	Students' Perception of History Learning	SCountry	Appreciating country	Factor Scores
			SCommunity	Appreciating society	Factor Scores
			SIndividual	Enhance maturity & moral value	Factor Scores

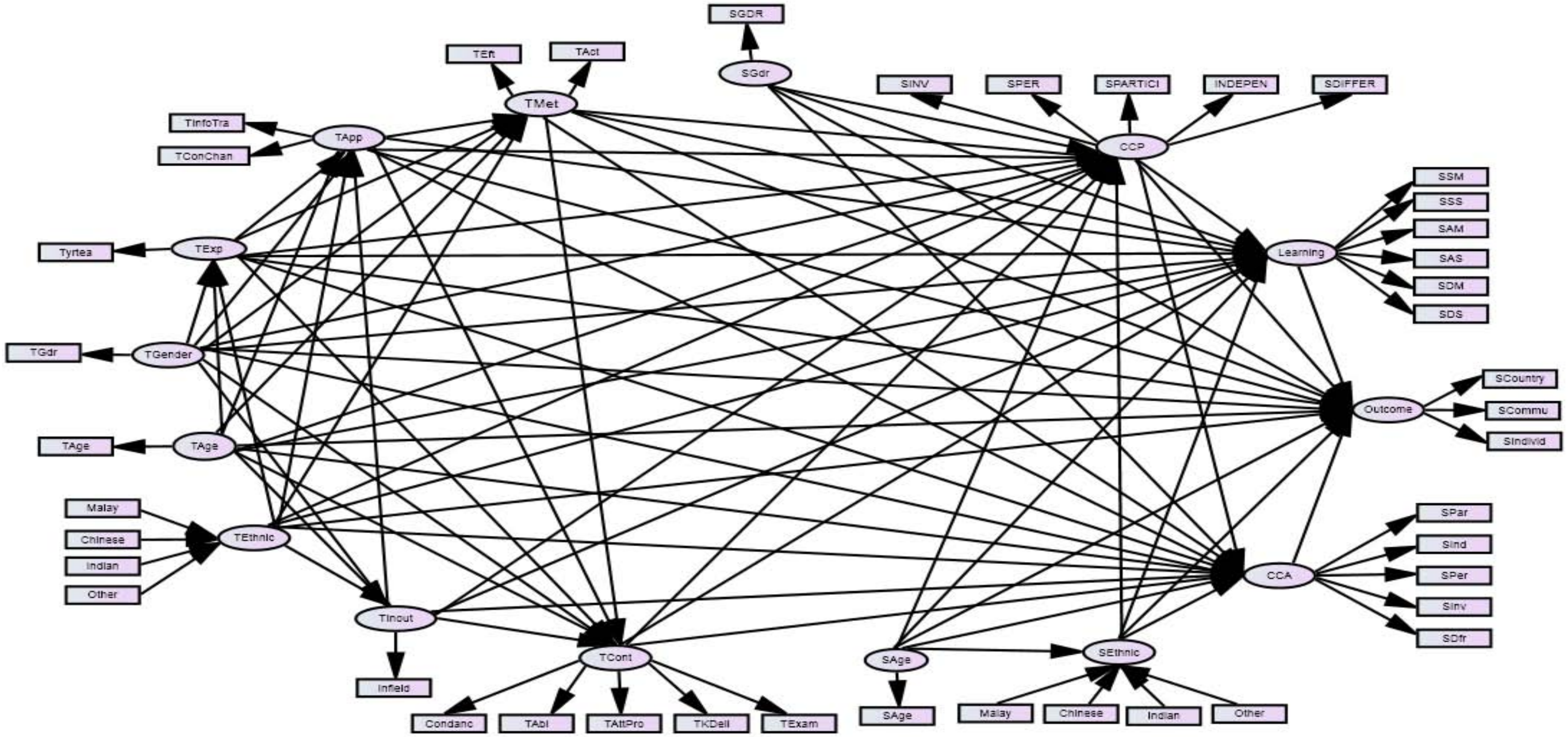

Figure 8. 1 Hypothesised Model For Students' Level Model 1

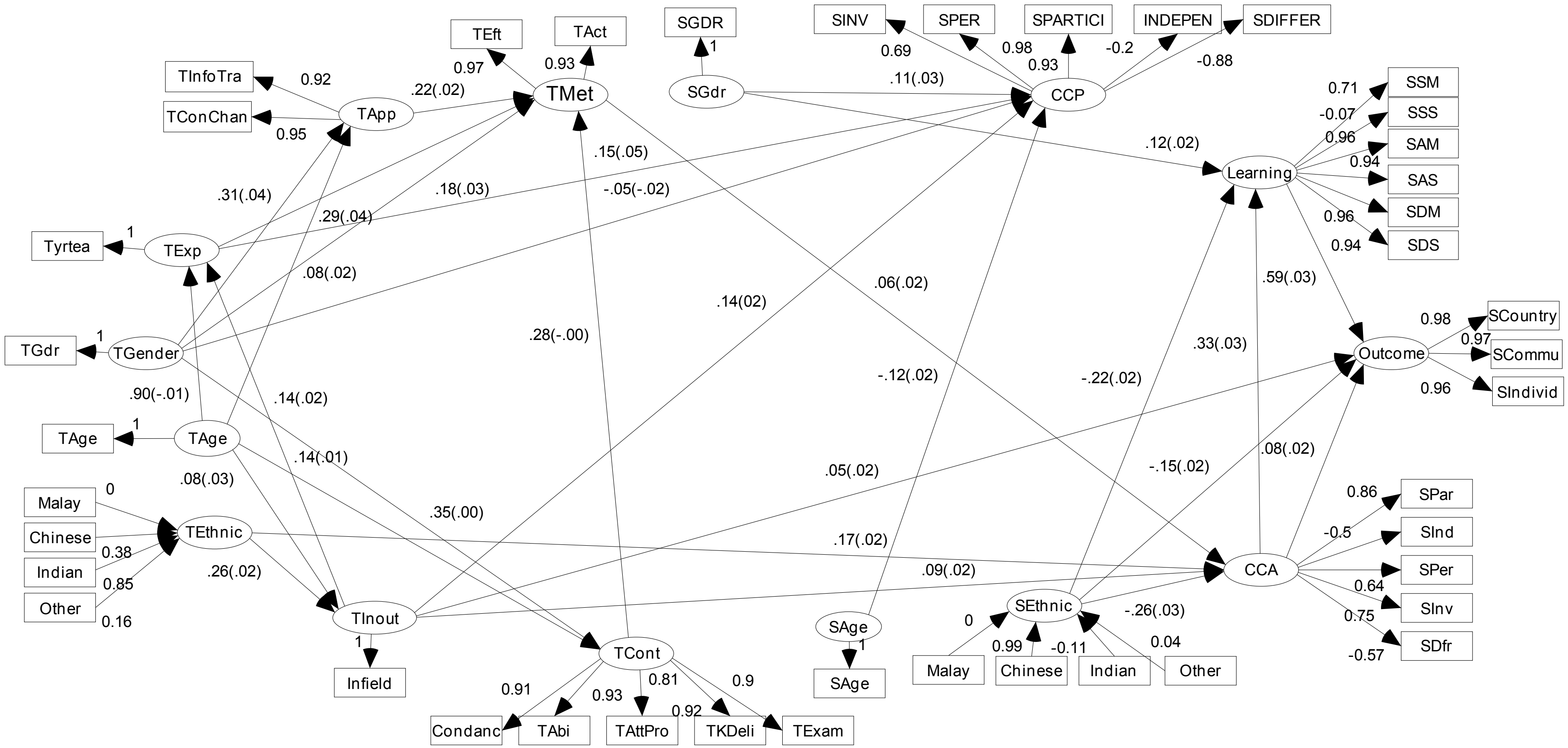

Figure 8. 2 Final Model for Students' Level Model 1

Table 8. 2 Variables in the Student Level Path Model 2

Latent Variable (Acronym)	Mode	Description	Manifest Variables (Acronym)	Description	Coding
TAge	unity	Teacher's age	TYear	Age in years	21-50
TGender	unity	Teacher's gender	TGdr	0=Male 1= Female	0=M 1=F
TEthnic	Inward	Teacher's ethnicity	TMalay	Malay (Dummy)	0=Not Malay 1=Malay
			TChinese	Chinese	0=Not Chinese 1=Chinese
			TIndian	Indian	0=Not Indian 1=Indian
			TOther	Iban/Melanau/Thai	0=Not Other 1=Other
TInout	unity	Respondent's qualification	In-field	In-field/ out of-field	In-field/ out of-field
TExp	unity	Years of teaching	Tytea	Teaching experience in History	Raw Scores
TApp	outward	Teaching approaches	TInfoTra	Information Transfer	Factor Scores
			TConChan	Conceptual Change	Factor Scores
TMet	outward	Teaching Methods	TEft	Teaching Effective	Factor Scores
			TAct	Teaching Active	Factor Scores
TCont	outward	Teaching Conception	TExam	Exam Preparation	Factor Scores
			TKDeli	Knowledge Delivery	Factor Scores
			TAttPro	Attitude Promotion	Factor Scores
			TAbiDev	Ability Development	Factor Scores
			ConDance	Conduct Guidance	Factor Scores
SAge	unity	Student's age	TYear	Age in years	17-18
SGender	unity	Student's gender	SGdr	0=Male 1= Female	0=M 1=F
SEthnic	Inward	Student's ethnicity	TMalay	Malay (Dummy)	0=Not Malay 1=Malay
			TChinese	Chinese	0=Not Chinese 1=Chinese
			TIndian	Indian	0=Not Indian 1=Indian
			TOther	Iban/Melanau/Thai	0=Not Other 1=Other
SCCA	outward	Classroom Climate Actual	SPar	Participation	Factor Scores
			Sind	Independence	Factor Scores
			SPer	Personalisation	Factor Scores
			SInv	Investigation	Factor Scores
			SDfr	Differentiation	Factor Scores
SCCP	outward	Classroom Climate Preferred	SINV	Investigation	Factor Scores
			SPER	Personalisation	Factor Scores
			SPARTICI	Participation	Factor Scores
			SINDEPEN	Independence	Factor Scores
			SDIFFER	Differentiation	Factor Scores
SSurface	outward	Surface Approaches	SSM	Surface Motive	Factor Scores
			SSS	Surface Strategy	Factor Scores
SDeep	outward	Deep Approaches	SAM	Achieving Motive	Factor Scores
			SAS	Achieving Strategy	Factor Scores
SAchieving	outward	Achieving Approaches	SDM	Deep Motive	Factor Scores
			SDS	Deep Strategy	Factor Scores
SOutcome	outward	Students' Perception of History Learning	SCountry	Appreciating country	Factor Scores
			SCommunity	Appreciating society	Factor Scores
			SIndividual	Enhance maturity & moral value	Factor Scores

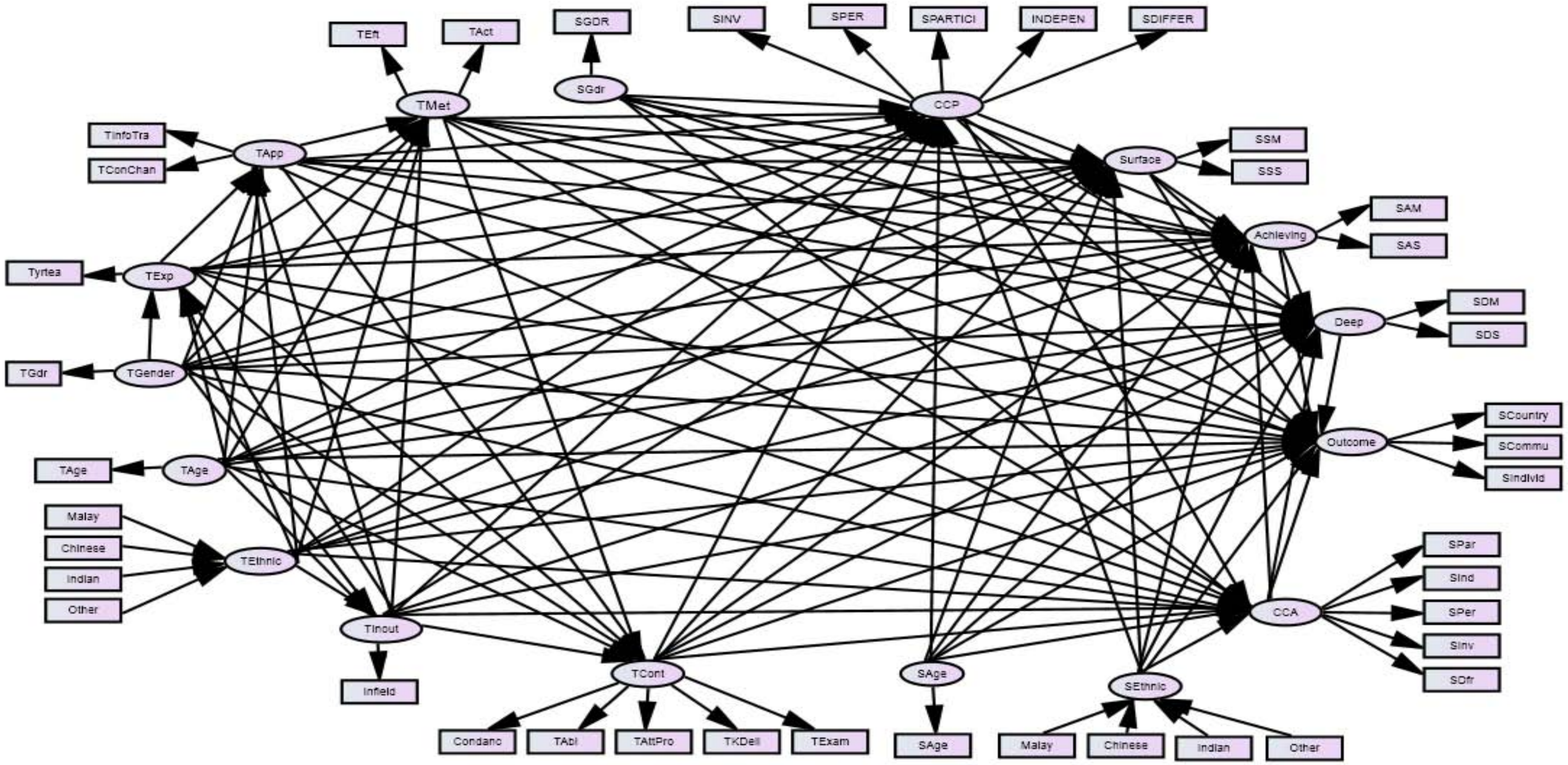

Figure 8. 3 Hypothesised Model for Students' Level Model 2

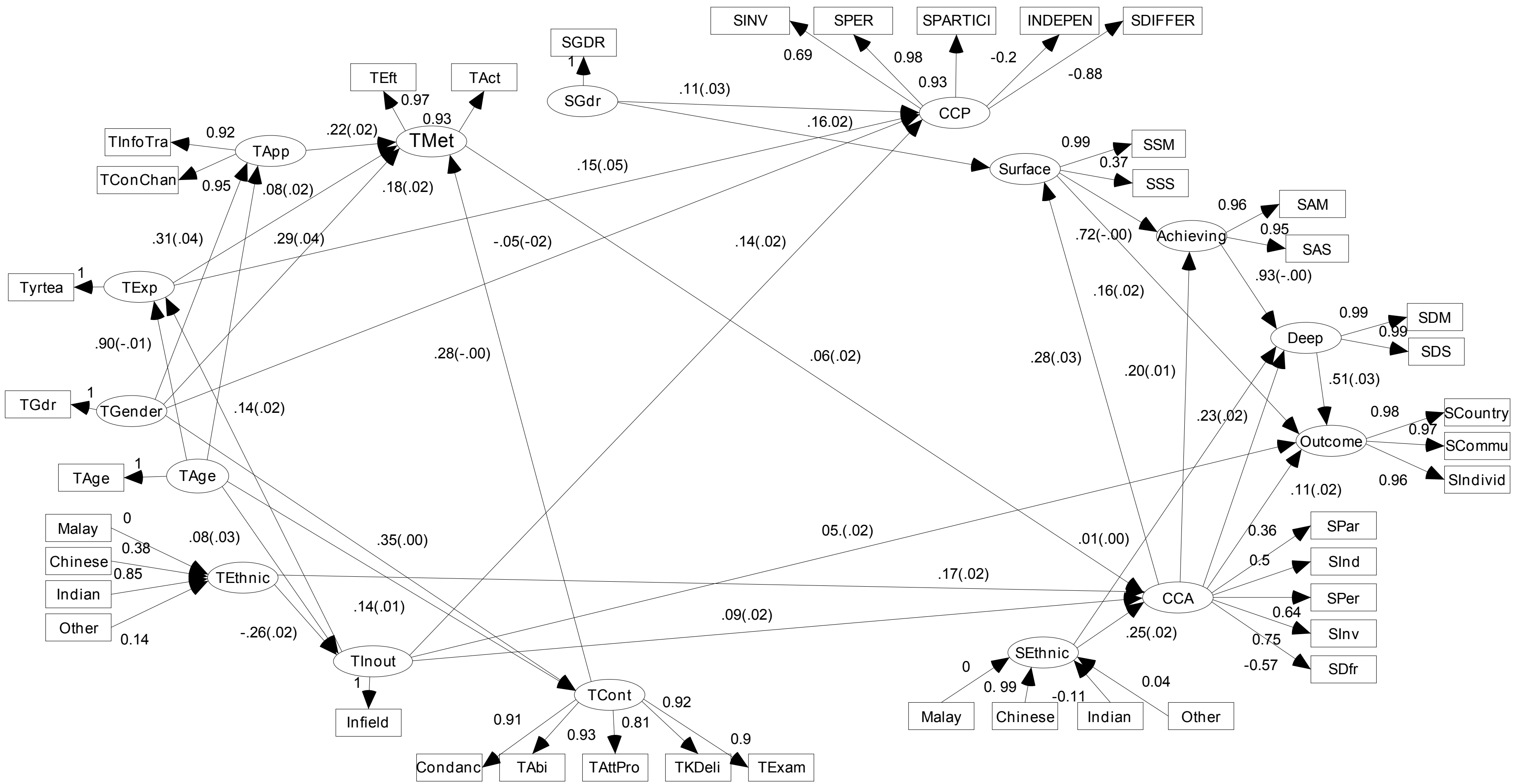

Figure 8. 4 Final Model for Students' Level Model 2

Table 8. 3 Indices for the Outer Model - Students' Level Path Model 1 and 2

		MODEL 1					MODEL 2				
Variables	**Mode**	**W**	**L**	**C**	**R**	**T**	**W**	**L**	**C**	**R**	**T**
AGE/years	unity	1	1	1	0	0	1	1	1	0	0
GENDER/sex	unity	1	1	1	0	0	1	1	1	0	0
TEthnic	inward										
Malay (D)		0	0	0	0	0	0	0	0	0	0
Chinese		0.49	0.38	0.14	0	0.02	0.49	0.38	0.14	0	0.02
Indian		0.91	0.85	0.72	0	0.01	0.91	0.85	0.72	0	0.01
Other		0.26	0.14	0.02	0	0.01	0.26	0.14	0.02	0	0.01
TInout	unity	1	1	1	0	0	1	1	1	0	0
TExp/ Tyrteac	unity	1	1	1	0	0	1	1	1	0	0
TApp	outward										
TInfoTra		0.48	0.92	0.86	0.09	0.58	0.48	0.92	0.86	0.09	0.58
TConChan		0.58	0.95	0.90	0.09	0.58	0.58	0.95	0.90	0.09	0.58
TMet	outward										
TEft		0.61	0.97	0.93	0.37	0.64	0.61	0.97	0.93	0.37	0.64
TAct		0.44	0.93	0.90	0.35	0.64	0.44	0.93	0.90	0.35	0.64
TCont	outward										
TExam		0.24	0.90	0.82	0.11	0.77	0.24	0.90	0.82	0.11	0.77
TKDeli		0.23	0.92	0.87	0.11	0.80	0.23	0.92	0.87	0.11	0.80
TAttPro		0.13	0.81	0.66	0.09	0.66	0.13	0.81	0.66	0.09	0.66
TAbiDev		0.22	0.93	0.84	0.11	0.77	0.22	0.93	0.84	0.11	0.77
ConDance		0.28	0.91	0.80	0.11	0.69	0.28	0.91	0.80	0.11	0.69
Sage/ years	unity	1	1	1	0	0	1	1	1	0	0
SGender /sex	unity	1	1	1	0	0	1	1	1	0	0
SEthnic	inward										
Malay (D)		0	0	0	0	0	0	0	0	0	0
Chinese		1.01	0.99	0.98	0.00	0.37	1.01	0.99	0.98	0.00	0.37
Indian		0.06	-0.11	0.01	0.00	0.03	0.06	-0.11	0.01	0.00	0.03
Other		0.14	0.04	0.00	0.00	0.01	0.14	0.04	0.00	0.00	0.01
SCCA	outward										
SPar		0.38	0.86	0.74	0.08	0.55	0.38	0.86	0.74	0.08	0.55
Sind		-0.14	-0.50	0.25	0.03	0.39	-0.14	-0.50	0.25	0.03	0.39
SPer		0.40	0.64	0.41	0.04	0.16	0.40	0.64	0.41	0.04	0.16
SInv		0.26	0.75	0.56	0.06	0.57	0.26	0.75	0.56	0.06	0.57
SDfr		-0.26	-0.57	0.32	0.03	0.15	-0.26	-0.57	0.32	0.03	0.15
SCCP	outward										
SINV		0.15	0.69	0.47	0.04	0.78	0.15	0.69	0.47	0.04	0.78
SPER		0.33	0.98	0.95	0.08	0.97	0.33	0.98	0.95	0.08	0.97
SPARTICI		0.29	0.93	0.88	0.07	0.97	0.29	0.93	0.88	0.07	0.97
SINDEPEN		-0.24	-0.20	0.04	0.00	0.46	-0.24	-0.20	0.04	0.00	0.46
SDIFFER		-0.30	-0.88	0.77	0.06	0.73	-0.30	-0.88	0.77	0.06	0.73
SOutcome	outward										
SCountry		0.34	0.98	0.96	0.10	0.91	0.34	0.98	0.96	0.10	0.91
SCommunity		0.34	0.97	0.94	0.45	0.88	0.34	0.97	0.94	0.45	0.88
SIndividual		0.35	0.96	0.95	0.45	0.89	0.35	0.96	0.95	0.45	0.89
SLearning											
SSM		0.18	0.73	0.55	0.12	0.96					
SSS		-0.01	-0.01	0.00	0.00	0.82					
SAM		0.24	0.96	0.92	0.10	0.97					
SAS		0.22	0.94	0.88	0.19	0.99					
SDM		0.24	0.96	0.92	0.20	0.99					
SDS		0.22	0.94	0.88	0.20	0.99					
Surface	outward										
SSM							1.10	0.99	0.99	0.10	0.22
SSS							-0.13	0.37	0.14	0.01	0.22
Achiev	outward										
SAM							0.55	0.96	0.92	0.59	0.67
SAS							0.50	0.95	0.90	0.58	0.67
Deep	outward										
SDM							0.52	0.99	0.97	0.87	0.89
SDS							0.50	0.99	0.97	0.87	0.89

Notes: W =Weight, L= Loadings, C= communality, R= Redundancy and T= Tolerance

8.3 Outer Model –Students' Level Path Model 1and 2

The outer model results indicate the strength of the relationships between the latent variables and the manifest variables, either in forming or reflecting the latent variables concerned (Rintaningrum et al., 2009). In PLSPATH, 'PATTERN' is the command line that refers to the relationship between LV and MV variables. In this model there were three modes involved: formative, reflective and unity mode (Darmawan, 2003, Rintaningrum et al., 2009). To refine the outer model, those variables which have no meaningful or adequate influence on the formation or reflection of the LVs, need to be removed from further analysis. The deletion procedure is based on five indices, namely, weight, loading, communality, redundancy, and tolerance. Additionally, due to the limitations in PLSPATH, Sellin (1989) suggested using jackknife methods to overcome the lack of any test of significance in PLSPATH analysis. This method, calculates the estimation of the standard error to use as a test of the significance of the results.

Table 8.3 presents the fit indices for the Students' Level Path Models 1 and 2. The following discussion of both these models is based on the five indices weight, loading, communality, redundancy, and tolerance. The weight indices are the strength of the regression relationships between LVs and MVs in the inward or formative mode. Relationships between LVs and MVs are considered meaningful if the values of the associated weight are equal to or greater than 0.10 (Sellin & Keeves, 1997). Where a weight of zero is recorded, the MV acts as a reference in the use of a dummy for variable regression analysis. In this study there were two inward mode variables, namely TEthnic and SEthnic.

Another criteria used for the outer model indices is loading, which indicates the strength of the factor analytic relationship between MVs and LVs in the outward or reflective mode (Sellin and Keeves, 1997). There are seven blocks with outward (reflective) modes in this model. Values equal to or larger than 0.40 are considered adequate loading values (Sellin and Keeves, 1997).

Communality indicates the strength of the outer model and is calculated as the squared correlation between MVs and their associated latent variables (Sellin, 1989. Falk 1987) claimed that the strength of the outer model is measured by the average communality values of all the variables He added that, communality values greater than 0.30, were considered strong. The higher the average for this communality index, the better the outer model (Falk, 1987).

Redundancy indicates the "joint predictive power of inner model and outer relationships as estimated for a given data set" (Sellin, 1989). Tolerance indicates the possible multicollinearity within a corresponding block of MVs. Tolerance is calculated as the squared correlation between a given MV and the remaining MVs belonging to the same LV (Sellin, 1995). It is commonly accepted (Sellin, 1989) that if the tolerance value is 0.50 or higher, multicollinearity within a block of MVs can be considered adequate According to Darmawan (2003), tolerance indicates the possibility of seriously damaging multicollinearity within the corresponding blocks of MVs. However these effects are considered damaging to the inward (formative) mode, rather than to the outward (reflective) mode. In this recent study, the possible multicollinearity in the model was strong in most the outward variables expect for the inward variables.

Discussion - Outer Models: Student Level Path Model 1 and 2

This section discusses the path model at student level Models 1 and 2. The distinction between student level model 1 and model 2 was the 'Learning Approaches' variables. On one hand, in Model 1, all variables were combined as student learning approaches 'SLearning'. On the other hand, in Model 2, the 'Learning Approaches' variables were discussed separately as such: surface, deep, and achieving. The results of the PLSPATH analysis of the student level data are discussed in two parts: a) outer (measurement) model and b) the inner (structural) model. This following section considers the former in relation to Student Level Path Models 1 and 2 (see Table 8.3)

Teachers Age (TAge)

Teachers' age (TAge) as a latent variable was formed by a single manifest variable, namely TYear. In the model, the TYear variable was reflected by a single indicator and the value of its loading was 1.00 (unity).

Teachers' Gender (TGender)

Teachers' Gender (TGender) was also reflected by a single indicator namely, TGdr. The value of its loading was 1.00 (unity).

Teacher Qualifications (Tinout)

Teacher Qualification, in relation to in-field and out-of-field teachers (Tinout) was also reflected by a single indicator namely, TIn-field. The value of its loading was 1.00 (unity).

Teachers' Experience (TExp)

Teachers experience (TExp) was also reflected by a single indicator namely, Tytea. The value of its loading was 1.00 (unity).

Student Age (SAge)

Student age (SAge) as a latent variable was formed out of a single manifest variable, namely SAge. In the model, the SAge variable was reflected by a single indicator and the value of its loading was 1.00 (unity).

Students Gender (SGender)

Students' Gender (SGender) was also reflected by a single indicator namely, SGdr. The value of its loading was 1.00 (unity).

Students' Ethnicity (SEthnic)

Student Ethnic (SEthnic) was formed by four MVs that represented the four ethnic groups the students belonged to, namely Malay, Chinese, Indian and Other Ethnicities. In this model, the Malay group was used as a reference point (Dummy). Therefore, the factor weight for Malay was set to 0. The factor weights for the three other groups were 0.99, -0.11 and 0.04, for Chinese, Indian, and Other Ethnicities respectively.

Teachers' Ethnicity (TEthnic)

Teachers' Ethnicity (TEthnic) was formed by four MVs that represented the four ethnic groups the teachers could belong to, namely Malay, Chinese, Indian and Other Ethnicities. In this model, the Malay group was used as a reference point (Dummy). Therefore, the factor weight for Malay was set to 0. The factor weights for the three other groups were 0.38, 0.85 and 0.14, for Chinese, Indian, and Other Ethnicities respectively.

Teacher Approaches (TApp)

Teacher Approaches (TApp) as a latent variable was reflected by only two MVs, namely, information transfer/teacher-focused (TInfoTra) and conceptual change/student-focused (TConChan). As an outward latent constructs, TApp was strongly reflected by these two MVs, with factor loadings of 0.92 and 0.95.

Teaching Methods (TMet)

Teaching Methods (TMet) construct was also reflected by two MVs namely, effective teaching (TEft) and active teaching (TAct). These two MVs were composite scores calculated using a principal component method. The way in which these MVs were formed explained in Chapter 5. These two MVs had high loadings (0.97 and 0.93), which indicated that this construct was strongly reflected by the two MVs.

Teacher Conceptions (TCont)

Five MVs reflected the construct of Teacher Conceptions (TCont), namely Exam preparation (TExam), Knowledge delivery (TKDeli), Attitude promotion (TAttPro), Ability development (TAbiDev) and Conduct guidance (ConDance). The sizes of the factor loading were moderate to high, being 0.90, 0.92, 0.81, 0.93 and 0.91respectively. These results indicated that all MVs were strong reflectors of the construct.

Students Classroom Climate Actual (SCCA)

Students Classroom Climate Actual (SCCA) was an outward latent variable reflected by five MVs, namely Student Participation (Spar), Student Independence (Sind), Student Personalisation (SPer), Student Investigation (SInv) and Student Differentiation (SDfr). The factor loadings for SPar, SInd, SPer, SInv, and SDfr were 0.86, -0.50, 0.64, 0.75 and -0.57. These coefficients indicated that the SCCA was strongly reflected by Student Participation (Spar), Student Personalisation (SPer), and Student Investigation (SInv). Participation was found to be the strongest reflector of SCCA in Malaysian context. Furthermore, Investigation and Differentiation both had negative coefficients, which could be interpreted that those classes where students actually experienced high levels of participation, personalisation and investigation scored low on independence and differentiation. The negative loadings indicated the corresponding manifest variables were in the opposite direction on the scale to those MVs that had positive loadings.

Students' Classroom Climate Preferred (SCCP)

In a similar way to Classroom Climate Actual, Students' Classroom Climate Preferred (SCCP) was reflected by five MVs, namely, Student Investigation (SINV), Student Personalisation (SPER), Student Participation (SPARTICI), Student Independence (SINDEPEN), and Student Differentiation (SDIFFER). The factor loadings were strong for SINV, SPER and SPARTICI (0.69, 0.98, and 0.93), with the exception of the negative loadings for SINDEPEN (-0.20) and SDIFFER (-0.88). This result could be interpreted that students in those classes that preferred Investigation, Personalisation, and Participation would score low on Independence and Differentiation. The negative loadings indicated that the corresponding manifest variables were in the opposite direction on the scale compared to those MVs that had positive loadings.

Students' Learning Outcomes (SOutcome)

Students' Learning Outcomes (SOutcome) were reflected by Student Country (SCountry), Student Community (StudentCommunity), and Student Individual (SIndividual). These three MVs had high factor loadings of 0.98, 0.97, and 0.96 respectively. This result indicated that this construct was strongly reflected by the three MVs.

Student Learning (SLearning)

Students' Learning (SLearning) was an outward mode latent variable reflected by six MVs, namely Student Surface Motive (SSM), Student Surface Strategy (SSS),Student

Achieving Motive (SAM), Student Achieving Strategy (SAS), Student Deep Motive (SDM), Student Deep Strategy (SDS). All MVs were strong reflectors of the construct, with loadings ranging from 0.37 to 0.99. SDM and SDS were found to be the strongest reflector of this construct. This construct was only available in the Model 1.

SURFACE

SURFACE was reflected by only two manifest variables namely, Student Surface Motive (SSM) and Student Surface Motive (SSM). As an outward latent construct, SURFACE was reflected by these two MVs with the factor loadings of 0.99 and 0.37 respectively. This construct is only in Model 2.

ACHIEVING (Achiev)

In a similar way to SURFACE, ACHIEVING (Achiev) was also reflected by two MVs namely, Student Achieving Motive (SAM) and Student Achieving Strategy (SAS). Both MVs were strong reflectors of achieving, with factor loadings of 0.96 and 0.95. This construct was only in Model 2.

DEEP

DEEP was reflected by only two MVs variables namely, Student Deep Motive (SDM), anad Student Deep Strategy (SDS). As an outward latent construct, DEEP was strongly reflected by these two MVs, with factor loadings of 0.99 and 0.99. This construct was only in Model 2.

Table 8. 4 Path Indices for PLS Inner Model – Student' Level Path Model 1 and 2

	MODEL 1					MODEL 2				
Variable	**Beta**	**JknMean**	**JknStd**	**Corr**	**Tolerance**	**Beta**	**JknMean**	**JknStd**	**Corr**	**Tolerance**
Teacher in-field/out-of field (TINOUT)										
Teacher Age (TAGE)	0.82	0.82	0.03	0.19	0.17	0.82	0.82	0.03	0.19	0.17
Teacher Ethnicity (TETHNIC)	0.26	0.26	0.02	0.30	0.17	0.26	0.26	0.02	0.30	0.17
Teaching Conception (TCONCEPT)										
Teacher Gender (TGENDER)	0.35	0.35	0.00	0.34	0.00	0.35	0.35	0.00	0.34	0.00
Teacher Age (TAGE)	0.14	0.14	0.01	0.12	0.00	0.14	0.14	0.01	0.12	0.00
Teacher Approaches (TAPPROAC)										
Teacher Conception (TCONCEPT)	0.35	0.35	0.00	0.31	0.00	0.35	0.35	0.00	0.31	0.00
Teacher Age (TAGE)	0.08	0.08	0.01	0.06	0.00	0.08	0.08	0.01	0.06	0.00
Teaching Method (TMETHOD)										
Teacher Gender (TGENDER)	0.18	0.18	0.03	0.33	0.13	0.18	0.18	0.03	0.33	0.13
Teacher Conception (TCONCEPT)	0.28	0.28	-0.00	0.52	0.56	0.28	0.28	-0.00	0.52	0.56
Teacher Approaches (TAPPROAC)	0.22	0.22	0.02	0.49	0.53	0.22	0.22	0.02	0.49	0.53
Teacher Year of Teaching (TEXP)	0.29	0.29	0.04	0.32	0.02	0.29	0.29	0.04	0.32	0.02
Teacher Year of Teaching (TEXP)										
Teacher Age (TAGE)	0.89	0.89	-0.01	0.92	0.04	0.89	0.89	-0.01	0.92	0.04
Teacher in-field/out-of field (TINOUT)	0.14	0.14	0.02	0.31	0.04	0.14	0.14	0.02	0.31	0.04
Classroom Climate Preferred (CCP)										
Teacher Gender (TGENDER)	-0.05	-0.05	-0.02	-0.06	0.00					
Teacher in-field/out-of field (TINOUT)	0.14	0.14	0.02	0.19	0.10	0.14	0.14	0.02	0.19	0.10
Student Gender (SGENDER)	0.11	0.11	0.03	0.12	0.00	0.11	0.11	0.03	0.12	0.00
Student Age (SAGE)	-0.12	-0.12	0.02	-0.11	0.01					
Teacher Year of Teaching (TEXP)	0.15	0.15	0.05	0.20	0.10	0.14	0.14	0.03	0.20	0.10
Classroom Climate Actual (CCA)										
Teacher Ethnicity (TETHNIC)	0.17	0.17	0.02	0.17	0.14					
Teacher in-field/out-of field (TINOUT)	0.09	0.09	0.02	0.06	0.10	0.09	0.09	0.02	0.17	0.02
Student Ethnicity (SETHNIC)	-0.26	-0.26	0.03	-0.25	0.03	0.26	0.26	0.03	-0.25	0.03
Teaching Method (TMETHOD)	0.06	0.06	0.02	0.13	0.10	0.06	0.06	0.02	0.13	0.02
Student Approaches to Learning (LEARNING)										
Student Gender (SGENDER)	0.12	0.12	0.02	0.14	0.00					
Student Ethnicity (SETHNIC)	-0.22	-0.22	0.02	-0.31	0.10					
Classroom Climate Actual (CCA)	0.33	0.33	0.03	0.39	0.10					
Students' Perception of History Learning (SOUTCOME)										
Teacher in-field/out-of field (TINOUT)	0.05	0.05	0.02	0.03	0.02					
Student Ethnicity (SETHNIC)	-0.15	-0.15	0.02	-0.34	0.13					
Classroom Climate Actual (CCA)	0.08	0.08	0.02	0.35	0.18	0.11	0.11	0.02	0.37	0.17
Student Learning Approaches (LEARNING)	0.59	0.59	0.03	0.66	0.20					
Surface Learning Approaches (SURFACE)						0.16	0.16	0.02	0.50	0.35
Deep Learning Approaches (DEEP)						0.51	0.51	0.03	0.65	0.41
Surface Learning Approaches (SURFACE)										
Student Gender (SGENDER)						0.16	0.16	0.02	0.17	0.00
Classroom Climate Actual (CCA)						0.28	0.28	0.03	0.28	0.00

Table 8.4 continued

Achieving Learning Approaches (ACHIEV)					
Classroom Climate Actual (CCA)	0.20	0.20	0.01	0.40	0.08
Surface Learning Approaches (SURFACE)	0.72	0.72	-0.00	0.78	0.08
Deep Learning Approaches (DEEP)					
Student Ethnicity (SETHNIC)	0.01	0.01	0.00	0.30	0.11
Classroom Climate Actual (CCA)	0.23	0.23	0.02	0.40	0.18
Achieving Learning Approaches (ACHIEV)	0.93	0.93	-0.00	0.95	0.20

Table 8. 5 Summary of Direct, Indirect and Total Effects for the Inner Model – Students' Level Path Model 1 and Model 2

	MODEL 1				MODEL 2			
Dependent Independent Variables	Direct β	Indirect i	Total β + i	Correlation r	Direct β	Indirect i	Total β + i	Correlation r
TINOUT	$R^2 = 0.94$				$R^2 = 0.94$			
TAGE	0.08	-	0.08	0.19	0.08	-	0.08	0.19
TETHNIC	0.26		0.26	0.30	0.26		0.26	0.30
TCONCEPT	$R^2 = 0.13$	-			$R^2 = 0.13$	-		
TGENDER	0.35	-	0.35	0.34	0.35	-	0.35	0.34
TAGE	0.14		0.14	0.12	0.14		0.14	0.12
TAPPROAC	$R^2 = 0.10$				$R^2 = 0.10$			
TGENDER	0.35	-	0.35	0.31	0.35	-	0.35	0.31
TAGE	0.08	-	0.10	0.06	0.08	-	0.10	0.06
TEXP	$R^2 = 0.86$				$R^2 = 0.86$			
TAGE	0.90	0.01	0.90	0.92	0.90	0.01	0.90	0.92
TETHNIC	-	0.04	0.04	0.40	-	0.04	0.04	0.40
TINOUT	0.14	-	0.14	0.31	0.14	-	0.14	0.31
TMETHOD	$R^2 = 0.40$				$R^2 = 0.40$			
TGENDER	0.18	0.16	0.34	0.33	0.18	0.16	0.34	0.33
TAGE	-	0.32	0.32	0.33	-	0.32	0.32	0.33
TETHNIC	-	0.01	0.01	0.24	-	0.01	0.01	0.24
TINOUT	-	0.04	0.04	0.10	-	0.04	0.04	0.10
TCONCEPT	0.28		0.28	1.01	0.28		0.28	1.01
TAPPROAC	0.22		0.22	0.49	0.22		0.22	0.49
TEXP	0.29		0.30	0.32	0.29		0.30	0.32
CCP	$R^2 = 0.08$				$R^2 = 0.65$			
TGENDER	-0.05	-	-0.05	-0.06				
TAGE	-	0.15	0.15	0.17	-	0.14	0.14	0.17
TETHNIC	-	0.04	0.04	0.07	-	-0.04	-0.04	-0.08
TINOUT	0.15	0.02	0.16	0.19	0.14	0.02	0.16	0.18
SGENDER	0.11	-	0.11	0.12	0.11	-	0.11	0.12
SAGE	-0.12	-	-0.11	-0.11				
TEXP	0.15	-	0.12	0.20	0.14	-	0.14	0.20
CCA	$R^2 = 0.10$				$R^2 = 0.79$			
TGENDER	-	0.02	0.02	0.03	-	0.03	0.03	0.02
TAGE	-	0.02	0.02	0.10	-	0.04	0.04	0.11
TETHNIC	0.20	0,01	0.18	0.17	-	-0.02	-0.02	-0.16
TINOUT	0.09	0.00	0.09	0.06	0.09	0.00	0.09	0.07
TCONCEPT	-	0.02	0.02	0.10	-	0.03	0.03	0.10
TAPPROAC	-	0.01	0.01	0.10	-	0.02	0.02	0.08
SETHNIC	-0.30	-	-0.26	-0.25	0.25	-	0.25	0.25
TEXP	-	0.02	0.02	0.13	-	0.03	0.03	0.13
TMETHOD	0.06	-	0.06	0.13	0.06	-	0.06	0.13
LEARNING	$R^2 = 0.21$							
TGENDER	-	0.01	0.01	0.04				
TAGE	-	0.01	0.01	0.05				
TETHNIC	-	0.06	0.06	-0.03				
TINOUT	-	0.01	0.01	-0.01				
TCONCEPT	-	0.01	0.01	0.06				
TAPPROAC	-	0.00	0.00	0.04				
SGENDER	0.12	-	0.12	0.14				
SETHNIC	-0.22	-0.09	-0.30	-0.31				
TEXP	-	0.01	0.01	0.06				
TMETHOD	-	0.02	0.02	0.08				
CCA	0.33	-	0.33	0.39				

Table 8.5 Continued

SURFACE					$R^2 = 0.11$			
TGENDER					-	0.01	0.01	0.01
TAGE					-	0.01	0.01	0.06
TETHNIC					-	-0.01	-0.01	0.04
TINOUT					-	0.03	0.03	-0.06
TCONCEPT					-	0.01	0.01	0.07
TAPPROAC					-	0.01	0.01	0.06
SGENDER					0.16	-	0.16	0.17
SETHNIC					-	0.07	0.07	0.26
TEXP					-	0.01	0.01	0.06
TMETHOD					-	0.03	0.03	0.11
CCA					0.28	-	0.28	0.28
ACHIEVING					$R^2 = 0.64$			
TGENDER					-	0.01	0.01	0.32
TAGE					-	0.01	0.01	0.05
TETHNIC					-	-0.01	-0.01	0.02
TINOUT					-	0.04	0.04	-0.01
TCONCEPT					-	0.01	0.01	0.06
TAPPROAC					-	0.01	0.01	0.04
SGENDER					-	0.11	0.11	0.15
SETHNIC					-	0.10	0.10	0.30
TEXP					-	0.01	0.01	0.06
TMETHOD					-	0.04	0.04	0.08
CCA					0.20	0.20	0.40	0.40
SURFACE					0.72	-	0.72	0.78
DEEP					$R^2 = 0.90$			
TGENDER					-	0.01	0.01	0.04
TAGE					-	0.01	0.01	0.04
TETHNIC					-	-0.01	-0.01	0.01
TINOUT					-	0.04	0.04	0.01
TCONCEPT					-	0.01	0.01	0.04
TAPPROAC					-	0.01	0.01	0.03
SGENDER					-	0.11	0.11	0.12
SETHNIC					0.01	0.10	0.11	0.30
TEXP					-	0.01	0.01	0.05
TMETHOD					-	0.04	0.04	0.05
CCA					0.23	0.37	0.40	0.40
SURFACE					-	0.67	0.67	0.57
ACHIEVE					0.93	-	0.93	0.95
SOUTCOME	$R^2 = 0.46$				$R^2 = 0.48$			
TGENDER	-	0.01	0.01	0.05	-	0.01	0.01	0.05
TAGE	-	0.01	0.01	0.10	-	0.01	0.01	0.10
TETHNIC	-	0.06	0.06	0.00	-	-0.01	-0.01	0.00
TINOUT	0.05		0.05	0.02	0.05		0.05	0.02
TCONCEPT	-	0.00	0.00	0.05	-	0.00	0.00	0.05
TAPPROAC	-	0.00	0.00	0.05	-	0.00	0.00	0.05
SGENDER	-	0.07	0.07	0.11	-	0.08	0.08	0.11
SETHNIC	-0.20		-0.20	-0.02	-	-0.20	-0.35	-0.34
TEXP	-	0.00	0.00	0.11	-	0.00	0.00	0.11
TMETHOD	-	0.02	0.02	0.05	-	0.03	0.03	0.05
CCA	0.10		0.36	0.35	0.11		0.11	0.02
LEARNING	0.59	-	0.59	0.66				
SURFACE	-	0.34	0.51	0.50	0.20		0.20	0.02
ACHIEV	-	0.48	0.47	0.66	-	0.48	0.47	0.66
DEEP	0.51	-	0.51	0.66	0.53	-	0.53	0.03

8.4 Inner Model–Students' Level Model 1 and 2

The inner or structural model results specify the strength of relationships between one LV regressed on other LVs (Rintaningrum et al., 2009). In PLSPATH program, the command lines to indicate these relationships are termed 'MODEL'. Any path between the LVs will be removed from the model if the path does not showed meaningful and adequate influence (Darmawan, 2003; Rintaningrum et al., 2009). The indicators commonly used to delete or remove paths which are not significant in the inner model, are: a) regression coefficient (beta), b) correlation coefficient (r), c) tolerance, d) jackknife means (JknMean), and e) jackknife standard error(JknStd). To check the predictive strength of the inner model R-square (R^2) was used.

One of the widely used indicators is Beta, which is the coefficient of the direct effect between one latent variable and another latent variable. Sellin (1989) suggested that beta coefficients are generally acceptable with a value of 0.05 or larger for a large a data set, or 0.10 for a small data set. According to Sellin and Keeves (1997), the larger the β, value, the larger is the effect on the path model. Any direct path that is less than 0.10, needs to be removed from the path model. This process needs to be undertaken iteratively until all non significant paths are removed.

The jackknife mean is the mean of the path coefficients obtained in each jackknife cycle. The jackknife standard error is the estimated error associated with each path coefficient. Correlation coefficients involve the zero-order or the product moment correlation coefficient between the given independent (predictor) latent variables and the dependents (criterion) latent variables (Sellin, 1989). Although in PLSPATH analysis the results do not provide a statistically significant test, Darmawan (2003, p. 82), has argued that 'where an estimated coefficient is more than twice the value of its jackknife standard error, the coefficient can be considered to be statistically significant at approximately the five per cent level of probability'.

The following discussions are based on the indices that presented in Table 8.5. Most of the variables had β values greater than 0.05. These results revealed that the beta coefficients for the inner model were acceptable.

Tolerance indicates the existence of multicollinearity and is calculated as the squared multiple correlations between an independent LV and the set of remaining independent LVs involved in the given inner model equations (Sellin, 1990). When the values are larger than 0.50, the relationship between the LVs and the associated LVs needs to be reconsidered. In these inner model results, the tolerance is an index that measures the relative amount of multicollinearity. The inner results in Table 8.5 showed that, most of the values of tolerance are less than 0.50. The next section describes the effects on the Latent Variable that involves in the path model of the endogenous and exogenous variables in the model.

The Effect ON the variable in the Inner Model–Student Level Path.Models 1and 2

This section discussed the relationships of the latent and manifest variables shown in the Students' Level Path Models in Figures 8.1 and 8.2. The discussions focuses on direct and indirect effects demonstrated.

TInout (In-field/ out-of-field teacher)

- R^2 = 0.94
- Teachers' Age (TAge) effect on TInout (β = 0.08, SE= 0.03)

- Teachers' Ethnicity (TEthnic) effect on TInout (β = 0.26, SE= 0.02)

The R^2 value for the TInout was 0.94, which indicated that teacher's age and ethnicity explain 94% of the variance of TInout. The results showed that there were two factors which had a direct effect on TInout: (a) teachers' age and (b) Teachers' Ethnicity.

There was a positive relationship between teachers' age and teachers' qualifications. In other words, the results revealed that older History teachers were more likely to be in-field History teachers' compared to their younger counterparts.

TEthnic variable (0.30) had a positive direct effect on the TInout in History learning. The results showed that the non-Malay teachers', such as Indian teachers' (0.85), Chinese (0.40, Other ethnicities (0.15) were more likely to be in-field teachers, while the Malay teachers were likely to be out-of-field History teachers. The ethnic background of the teachers thus had a sizeable effects on the TInout (total effect = 0.26) compared to TAge (total effect= 0.08). There were no indirect effects on Tinout.

TExp (Years of Teaching)

- R^2 = 0.86
- Teachers' Age (TAge) effect on TExp (β = 0.90, SE= -0.01)
- TInout (In-field/out-of-field History teacher) effect on TExp (β = 0.14, SE= 0.02)

The R^2 value for the TExp was 0.86, indicating that the models explained 86% of the variance of TExp. Two factors, TAge and Tinout, were found to have direct effects on TExp.

As might be expected, teachers' age had a strong effect on teachers' experience. This meant that the older the teachers were the more experienced they became, compared to the younger History teachers. Similarly, the results showed that in-field History teachers were more experience compared to out-of-field History teachers.

In addition, teachers' age and teachers' ethnicity also influenced teaching experience indirectly through the in-field/out-of-field constructs.

TCont (Teaching Conceptions)

- $R^2 = 0.13$
- Teacher Gender (TGender) effect on TCont (β = 0.35, SE= 0.00)
- Teacher Age (TAge) effect on TCont (β = 0.14, SE= 0.01)

The R^2 value for the TCont was 0.13, which indicated that the models explained 13% of the variance of TCont. There were two factors that directly influenced the teacher conceptions (TCont). They were TGender and TAge and both were positive effects.

The results indicated that female History teachers tended to have stronger teaching conceptions towards History teaching in the classroom compared to male teachers. The effect of age on teaching conception indicated that older History teachers were more likely to have stronger teaching conceptions towards History teaching in the classroom compared to the younger teachers.

TApp (Teaching Approaches)

- $R^2 = 0.10$
- Teacher Gender (TGender) effect on TCont (β = 0.35, SE= 0.00)
- Teacher Age (TAge) effect on TCont (β = 0.14, SE= 0.01)

The R^2 value for the TApp was 0.10, indicating that the models explained 10% of the variance of TApp. There were two factors that directly influenced the teaching approaches (TApp), TGender and TAge. Both of these variables positively influenced the

TApp. The result indicated that female History teachers were more likely to employ an effective teaching approach compared to their male counterparts. In addition, these results also indicated that older History teachers were more likely to adopt higher level teaching methods in the classroom.

TMet (Teaching Methods)

- R^2 = 0.40
- Teachers' Gender (TGender) effect on TMet (β = 0.18, SE= 0.03)
- Teaching Conception (TCont) effect on TMet (β = 0.28, SE= -0.00)
- Teachers' Approaches (TApp) effect on TMet (β = 0.22, SE= 0.02)
- Teachers' Years' of Teaching (TExp) effect on TMet (β = 0.29, SE= 0.04)

The R^2 value for the TMet was 0.40, indicating that the model explained 40% of the variance of TMet. In this path model, there were two manifest variables reflected the teacher teaching method; effective (0.97) and active (0.93) teaching methods. There were four factors that directly influenced teachers' teaching methods (TMet): the TGender, TCont, TApp, and TExp.

All these variables had positive influence on the teaching approaches. The results showed that female History teachers employed more effective and active teaching methods compared to male History teachers.

The positive relationship between TMet and teaching conceptions indicated that those History teachers who had higher teaching conceptions employed more effective and active teaching methods.

The third variable that directly influenced the TMet were TApp. The teaching approaches in these two models were refelected by two manifest variables: included in the model. Which were a) the Information transfer/teacher-focused (TInfoTra) (0.93) and b) conceptual change/student-focused (TConChan) (0.95). The results indicated that the teachers who adopted a higher level teaching approach were more likely to implement more effective and active teaching methods. Beside this, as the number of years teaching increased, teachers were likely to employ more effective and active teaching methods.

Table 8.5 showed the indirect effects of latent variables that influenced History teacher Teaching Method (TMet). The result indicates that indirect effect of TGender (i=0.16) through TAge (i=0.32); TEthnic (i = -0.01) through TMet (0.40).

- Teacher Gender (TGender) (i = 0.16)
- Teacher Age (TAge) (i = 0.32)
- Teacher Ethnic (TEthnic) (i = -0.01))
- Teacher In-field/ out-of-field (TInout) (i = 0.04)

TEthnic showed the smallest effects (i = -0.01) compared to other variables. TGender showed indirect effects on TMet (0.16) in addition to the direct effect discussed above. The effect of gender on teaching methods through TApp was 0.16. This meant that female teachers who were high on teaching approaches were more likely to employed have effective and active teaching method in History lesson. In addition, TAge influenced teaching method through TApp (i=0.32). TInout also had an indirect effect on TMet (i = 0.04) through TExp.

However, the TEthnic variable (-0.01) had very small negative indirect effects on the teaching methods (TMet) in History learning. This result indicated that Indian teachers (0.85), were less likely to employ effective and active teaching methods, than those of Malay, Chinese and other ethnic backgrounds.

CCP (Classroom Climate Preferred)

- $R^2 = 0.08$
- Teacher Gender (TGender) effect on CCP (β = -0.05, SE= 0.02)
- TInout (In-field/out-of-field History teacher) effect on CCP (β = 0.14, SE= 0.02)
- Students' Gender (SGender) effect on CCP (β = 0.11, SE= 0.03)
- Students' Age (SAge) effect on CCP (β = -0.12, SE= 0.02)
- Teachers' Year of Teaching (TExp) effect on CCP (β = 0.15, SE= 0.05)

The R^2 value for the CCP was 0.08, indicating that the model explained 8% of the variance of CCP. There were five factors that directly influenced the classroom climate preferred (CCP): TGender, TInout, SGender, SAge and TExp. Besides having direct effects, CCA had also indirectly effects from TAge (i = 0.15), TEthnic (i = 0.04), and TInout (i = 0.14).

The direct relationship between CCP and TGender (teachers' gender) indicated that students taught by the female History teachers were more likely to prefer classrooms that higher degree of personalisation (0.98), participation (0.93), and investigation (0.69) but less emphasis on the independence (-0.20), and differentiation (-0.88).

Students taught by in-field History teachers' were more likely to have classes in which, on average, students preferred to experience more personalisation, participation and investigation, but less the independence and differentiation in their History classroom.

The results showed a positive relationship between SGender and CCP. This result indicated that classrooms that had higher proposition of girls were more likely to prefer more personalisation, participation and investigation in their learning activities but less independence, and differentiation compared to History classes that had more boys. In addition, those students in classes taught by experienced History teachers were more likely to want more personalisation, participation and investigation but less independence, and differentiation as their preferred classroom environment (CCP), compared to students under novice History teacher. The results also indicate that the older the students were the more likely they wanted to experience personalisation, participation and investigation and but less independence and differentiation in their History classroom.

As shown in the path diagram in Figure 8.1 the preferred classroom climate (CCP) were indirectly influenced by three variables. These were:

- Teacher Age (TAge) (i = 0.15)
- Teacher Ethnic (TEthnic) (i = 0.04)
- TInout (In-field/out-of-field History teacher) (i = 0.02)

The preferred classroom environment (CCP), variable was influenced indirectly by teacher age (TAge) (0.15) and TInout (0.02) through the teacher experience (TExp) construct. The results indicated that older teacher who more likely in-field History teachers tended to have classes where students preferred more personalisation (0.98), participation (0.93), and investigation (0.69) but less independence (-0.20), and differentiation(-0.88), compared to students under out-of-field History teachers. CCP was also influence indirectly by Teachers' Ethnicity through the in-field/out-of-field construct (0.04).

TEthnic also had positive indirect effects on ACHIEV. Although, it is a relatively small effect (0.04.) It can be interpreted that students under Indian teachers (0.85), were more likely to prefer personalisation, participation and investigation but less independence and differentiation in their History classroom, than students under teachers of Malay (D) , Chinese (0.38) and other ethnic (0.16) background.

CCA (Classroom Climate Actual)

- R^2 = 0.10
- Teacher Ethnic (TEthnic) (β = 0.17, SE = 0.02) on CCA
- TInout (In-field/out-of-field History teacher) effect on CCA (= β 0.09, SE= 0.02)
- Student Ethnicity (SEthnic) effect on CCA (β = -0.26, SE= 0.03)
- Teaching Methods (TMet) effect on CCA (β = 0.06, SE= 0.02)

The R^2 value for the CCA was 0.10, which indicated that the model explained 10% of the variance of CCA. There were four factors that were found to have direct effects on CCA;a) TEthnic b) TInout, c) SEthnic, and d) TMet.

TEthnicity (0.20) had a direct effect on the actual classroom climate (CCA) in History learning. The results indicated that students under Indian teachers (0.85), were more to experience participation (0.86), investigation (0.75) and personalisation (0.64) and less independence (-0.50), and differentiation (-0.57) in their actual learning History classroom climate.

There was a positive relationship between TInout and CCA. This result indicated that that 'in-field' History teachers were more likely to have classes in which students actually experienced more participation (0.86), investigation (0.75) and personalisation (0.64), but less independence (-0.50), and differentiation (-0.57) compared to students in classes under out-of-field History teachers.

The results showed a negative relationship between SEthnic and CCA. The negative sign indicates that Chinese (0.99), and those of other ethnic (0.04) background, experienced more participation (0.86), investigation (0.75) personalisation (0.64), and less independence (-0.50), and differentiation (-0.57) in their actual History classroom environment compared to Malay and Indian students. In addition, the results showed a small positive relationship between CCA and teachers who employed effective and active teaching methods.

Indirect Effect on CCA were observed from the following variables:

- Teacher Gender (TGender) (i = 0.15)
- Teacher Age (TAge) (i = 0.15))
- Teacher Ethnic (TEthnic) (i = 0.04)
- TInout (In-field/out-of-field History teacher) (i = 0.02)

TGender had an indirectly effect on the CCA through Teaching Methods (0.15). This result indicated that in the actual classroom environment female History teachers were more likely to encourage participation (0.86), investigation (0.75) personalisation (0.64), and but less independence (-0.50), and differentiation (-0.57) compared to male teachers.

TAge had an indirect effect on the classroom climate actual (CCA) through teacher Approaches (TAPP) and Teaching Method (TMet). The results revealed that older teachers who were more likely to be in-field History teachers tended to have classes where students, on average, experienced higher levels of participation (0.86), investigation (0.75) personalisation (0.64), but lower levels of independen (-0.50), and differentiation (-0.57) in their actual classroom. In addition to this indirect effect, CCA was also influenced by Teacher Ethnicity (Ethnicity) through in-field/out-of-field construct (0.04) and TInout through Teacher Experience (0.02).

The Effect ON the variable in the Inner Model- Students' Level Path Model 1

This section discusses variables in the inner models which had an effect on Student Approaches to Learning as it was set up in Model 1, where all learning approaches were combined into a single variables 'SLearning'.

Student Approaches to Learning (SLearning)

- R^2 = 0.21
- Student Gender (SGender) effect on (SLearning) (β = 0.12, SE= 0.02)
- Student Ethnicity (SEthnic) effect on (SLearning) (β = -0.23, SE= 0.02)
- Classroom Climate Actual (CCA) effects on (SLearning) (β = 0.33, SE= 0.03)

The R^2 value for the SLearning was 0.21, indicating that the Student Level Path Model explained 21% of the variance of SLearning in this model. There were six manifest variables reflecting students' approaches to learning. They were (1) deep, (2) surface, and (3) achieving. There were three factors that were found to have direct effects on SLearning namely; (a) SGender (b) SEthnic, and (c) CCA. (see Figure 8.1).

Results showed that girls were more likely adopted higher order learning approaches.

SEthnic had a direct effect on SLearning. Path analysis results showed a positive influence of CCA on SLearning, This result indicated that the actual classroom environments of students positively affected their approaches to learning.

The analysis for Students' Level path Model 1 revealed nine variables that have indirect effects on Students' Learning. There are listed below:

- Teacher Gender (TGender) (i = 0.01)
- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnic (TEthnic) (i = 0.06)
- TInout (In-field/out-of-field History teacher) (i = 0.01)
- Teaching Conception (TCont) (i = 0.01) effect on SLearning (R^2= 0.21)
- Teacher Approaches (TApp) (i = 0.00)
- Student Ethnicity (SEthnic) (i = -0.09)
- Teacher Year of Teaching (TExp) (i = 0.01)
- Teaching Methods (TMet) (i = 0.02)

Only one of these is discussed. Teacher Age was found to have and indirect effect on student approaches to learning (SLearning). The results show positive relationships between SLearning and TAge through CCA construct (0.06). This result indicated that students' under older teachers who were more likely to be in-field History teachers tended to adopt high order learning approach.

Students' Perception of History Learning Outcome (SOutcome)

- R^2 = 0.46
- TInout (In-field/out-of-field History teacher) effect on SOutcome (β = 0.05, SE= 0.02)
- Student Ethnicity (SEthnic) effect on SOutcome (β = 0.20, SE= 0.02)
- Classroom Climate Actual (CCA) effect on SOutcome (SLearning) (β = 0.10, SE= 0.02)
- Student Learning Approaches (SLearning) effect on SOutcome (β = 0.59, SE= 0.03)

The R^2 value for the SOutcome variables was 0.46, indicating that the Student Level Path Model 1 explained 46% of the variance of SOUTCOME. Four factors were found to have direct effects on SOutcome: (a) Tinout (b) SEthnic, and (c) CCA, and (d) SLearning.

SLearning (β=0.59, SE= 0.03) had the strongest direct effect on History learning outcome (SOutcome), demonstrating that the learning approach which student adopted had a considerable effect on their perceptions of History learning outcome (SOutcome). The results for Classroom Climate Actual (0.10) was smaller, and for out-of-field teachers (0.05) even less, but suggested that students in more positive classroom climates, and under in-field teachers, were to some extent more likely to have higher perceptions of History learning objectives.

Eleven variables had indirect effects on students learning outcomes. These were:

- Teacher Gender (TGender) (i = 0.01)
- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnic (TEthnic) (i = 0.06)
- TInout (In-field/out-of-field History teacher) (i = 0.05)
- Teaching Conception (TCont) (i = 0.001)
- Teacher Approaches (TApp) (i = 0.001)
- Student Gender (SGender) (i = 0.07)
- Student Ethnicity (SEthnic) (i = -0.35)
- Teacher Year of Teaching (TExp) (i = 0.00)
- Teaching Methods (TMet) (i = 0.02)
- Classroom Climate Actual (CCA) (i = 0.28)

Most of these effects were quite small and are not discussed further.

The Effect ON the variable in the Inner Model- Student Level Model 2

This section discusses variables in the inner models which had an effect on Students' Learning Approaches as it was set up in Model 2, where all learning approaches discuss here.

SURFACE (Surface Learning Approaches)

- $R^2 = 0.11$
- Student Gender (SGender) effect on SURFACE (β = 0.16), SE= 0.02)
- Classroom Climate Actual (CCA) effect on SURFACE (β = 0.28, SE= 0.03)

The R^2 value for the SURFACE was 0.11, which indicated that the Student Level Path Model 2 explained 11% of the variance of SURFACE. Figure 8.2 showed that SURFACE learning approach was influenced by students' gender (0.20) and CCA (0.30). These variables were found to have positive direct effects on SURFACE learning approach.

Results showed that girls were more likely to adopt surface learning approaches compared to boys. The results also indicated a positive relationship between CCA and SURFACE, suggesting that the Accual Classroom Climate experienced by the students, directly influenced their adoption of SURFACE learning approach.

The analysis for Students' Level Path Model 2 revealed nine other variables were found to have indirect effects on Surface Learning Approaches namely;

- Teacher Gender (TGender) (i = 0.01)
- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnicity (TEthnic) (i = -0.01)
- TInout (In-field/out-of-field History teacher) (i = 0.03)
- Teaching Conception (TCont) (i = 0.01)
- Teacher Approaches (TApp) (i = 0.01)

- Students' Ethnicity (SEthnic) (i = 0.10)
- Teachers' Years of Teaching (TExp) (i = 0.01)
- Teacher Method (TMet) (i = 0.03))

Most of the variables were showing small indirect effects on SURFACE learning approach.

ACHIEV (Achieving Learning Approaches)

Table 8.5 showed that;

- $R^2 = 0.64$
- Classroom Climate Actual (CCA) effect on ACHIEV (β = 0.20, SE= 0.01)
- Surface Approaches to Learning (SURFACE) effect on ACHIEV (β = 0.72, SE= -0.00)

The R^2 value for the ACHIEV was 0.64, which indicated that the Student Level Path Model 2 explained 64% of the variance of ACHIEV. The Actual Classroom Climate (CCA) and SURFACE learning approach were found to have positive and significant direct effect on ACHIEV. CCA had a direct effect (β = 0.20), suggesting that the Actual Classroom Climate experienced by the students directly effected their adoption of the Achieving Learning Approaches and indirectly (i = 0.20) to adopt the achieving learning approach through SURFACE.

Another factor with a direct influence on History learning approaches was SURFACE. This result suggested that those students who adopted SURFACE approaches to learning were likely to also employ ACHIEV approaches to learning during the History lesson.

There were eleven other variables which had indirect effect on Achieving Learning Approaches. There are listed below:

- Teacher Gender (TGender) (i = 0.01)

- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnic (TEthnic) (i = -0.01)
- TInout (In-field/out-of-field History teacher) (i = 0.04)
- Teaching Conception (TCont) (i = 0.01)
- Teacher Approaches (TApp) (i = 0.01)
- Student Gender (SGender) (i = 0.11)
- Students Ethnic (SEthnic) (i = 0.10)
- Teacher Year of Teaching (TExp) (i = 0.01)
- Teacher Method (TMet) (i = 0.04)
- Classroom Climate Actual (CCA) (i = 0.20)

Most of these variables showed a very small indirect effect and not discussed further.

DEEP (Deep Learning Approaches)

- R^2 = 0.90

- Students Ethnic (SEthnic) effect on DEEP(β = 0.01, SE= 0.00)
- Classroom Climate Actual (CCA) effect on DEEP (β = 0.23, SE= 0.02)
- Achieving Approaches to Learning (ACHIEV) effect on DEEP (β = 0.93, SE= -0.00)

The R^2 value for the DEEP was 0.90, which indicated that the Student Level Path Model 2 explained 90% of the variance of DEEP. There were three variables found to have direct effect on deep approach to learning (DEEP). Students' Ethnicity and Classroom Climate Actual both positive both effects on DEEP approach. SEthnic have a direct effect of 0.01 and an indirect effect 0.10. The CCA has a direct effect of 0.03, and an indirect effect of 0.40. The indirect effects were larger than the direct effects for both variables.

On the other hand, ACHIEV (0.93) showed a stronger effect directly on DEEP approach to learning. The direct effects of ACHIEV revealed that students' with ACHIEVE approach to learning were likely to employ the DEEP approach to learning in the History classroom.

Thirteen variables were shown to have indirect effect on the Deep Learning Approaches. There were listed below:

- Teacher Gender (TGender) (i = 0.01)
- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnic (TEthnic) (i = -0.01)
- TInout (In-field/out-of-field History teacher) (i = 0.04)
- Teaching Conception (TCont) (i = 0.01)
- Teacher Approaches (TApp) (i = 0.01)
- Student Gender (SGender) (i = 0.11)
- Students Ethnic (SEthnic) (i = 0.10)
- Teacher Year of Teaching (TExp) (i = 0.01)
- Teacher Method (TMet) (i = 0.04)
- Classroom Climate Actual (CCA) (i = 0.40)
- Surface Approaches to Learning (SURFACE) (i = 0.67)
- Achieving Approaches to Learning (ACHIVE) (i = 0.93)

CCA showed indirect effects on DEEP. This result suggested that the Actual Classroom Climate experienced by the students had considerable indirect effect on their adoption of Deep Learning Approach through ACHIEV (i= 0.40). In addition to this, SURFACE (i=0.67) had a stronger indirect effects on DEEP approach in learning through ACHIEVE. This result indicates that students' who employed Surface learning approach were likely to adopt the DEEP and ACHIEVING learning approach in the History classroom. The largest indirect effect was Achieving Approaches to Learning. Indicating that student who had reached this level of learning were most likely to adopt Deep Approaches to Learning in the History classroom.

Students Perception of History Learning Objective (SOutcome)

- $R^2 = 0.48$
- Classroom Climate Actual (CCA) effect on SOutcome (β = 0.11, SE= 0.02)
- Surface Approaches to Learning (SURFACE) effect on SOutcome (β = 0.16, SE= 0.02)
- Deep Approaches to Learning (DEEP) effect on SOutcome (β = 0.51, SE= 0.03)
- TInout (In-field/out-of-field History teacher) effect on SOutcome (β = 0.05, SE= 0.02)

The R^2 value for the SOutcome was 0.48, which indicated that the model explained 50% of the variance of SOutcome. There were four variables found to have direct effect on students' perception of History learning (SOutcome) namely, CCA, SURFACE, and DEEP, and TIout (In-field/out-of-field).

Overall, the sizeable direct effect on SOutcome was from DEEP (0.51). This result (see Figure 8.2) indicated that students that employed DEEP learning approach were likely to perceive learning History at a higher or level of appreciation to the efforts and the contributions of individuals who struggled for independence and development of the country (0.97), individual (0. 96) and community (0.98).

The CCA result indicated that the actual classroom climate experienced by students influenced their perceptions on how well the History learning achieved its objectives.

SURFACE (0.20) also have positive effects on SOutcomes. The results indicated that classroom in which more students adopted a SURFACE approach were more likely to have positive perception of History learning outcomes (SOutcomes). This result could be accounted for by rote learning which is a mark of Surface approach to learning. In addition, TIout (in-field and out-of-field) had a small direct and indirect effects on History learning outcomes (SOutcomes).

There were thirteen variables which had indirect effect on SOutcome. Most of these had small effects and are not discussed further.

- Teacher Gender (TGender) (i = 0.01))
- Teacher Age (TAge) (i = 0.01)
- Teacher Ethnic (TEthnic) (i = -0.06))
- TInout (In-field/out-of-field History teacher) (i = 0.01)
- Teaching Conception (TCont) (i = 0.00)
- Teacher Approaches (TApp) (i = 0.01)
- Student Gender (SGender)
- Students Ethnic (SEthnic) (i = 0.20)
- Teacher Year of Teaching (TExp) (i = 0.00)
- Teacher Method (TMet) (i = 0.02)
- Classroom Climate Actual (CCA) (i = 0.10)
- Surface Approaches to Learning (SURFACE) (i =0.34)
- Achieving Approaches to Learning (ACHIEV) (i =0.48)

However, two variables namely Surface and Achieving Learning Approach were found to have indirect influences on SOutcomes through DEEP. The result could be interpreted that students who employed achieving learning approaches tended to have more positive perceptions of History learning outcomes (SOutcomes). In addition to its direct effect SURFACE was found to have indirect effect on SOutcome (0.34).

8.5 Summary of Analysis for Students' Level – Path Models 1and 2

This section summarized the main findings from path analysis for Models 1 and 2. In Model 1, SLEARNING was taken as a single variable (see Figure 8.1). In Model 2, however, the 'Learning Approaches' variables were discussed as six separate variables:

surface motive, deep motive, achieving motive, surface strategy, deep strategy, achieving strategy (See Figure 8.2). The other LVs and MVs were the same in both models.

(a) For Conceptions of teaching, the results indicated that there were two direct effects: by Teacher Gender and Teacher Age. The results showed that Teacher Gender had larger direct effects compared to Teacher Age. This meant that female History teachers tended to have higher conceptions toward History teaching compared to the male History teacher.

(b) In relation to Teaching approaches, the results revealed positive direct influence of Teacher Gender and Teacher Age on Teaching Approaches. Thus, female teachers were more likely to employ effective and active teaching methods compared to their male counterparts.

(c) In case of TInout (In-field/ out-of-field teacher), there were two factors that were found to have a direct influence on TInout namely: (a) teachers' age and teachers' ethnicity. The results showed that Teacher Ethnicity had a positive direct effect on TInout (In-field/ out-of-field teacher), in History learning. Which meant that non-Malay teachers, such as those of Indian, Chinese, and other background were more likely to be in-field History teachers group, and Malays to be out-of-field History teachers. The ethnic background of the teachers had a sizeable effects on the TInout (In-field/ out-of-field teacher), compared to Teacher Age

(d) For Teaching Approaches, the teacher variables (TGender, TCont, TApp, and TExp) were shown to have positive influence. The results showed that female History teacher employed more effective and active of teaching methods compared to male History teachers. History teachers who had higher teaching conception tended to employ more effective and active teaching methods. In addition, the results revealed that as teachers became more experiences over the years they were likely to employ effective and active teaching methods.

(e) In relation to, Teaching experience (years of teaching), the results indicated a positive relationship with two variables: teachers' age and teacher TInout ('in-field' and 'out-of-field'). In the case of teachers' age, the direct effect was considerably, indicating that as teachers' age increased they were more likely to become experienced compared to the younger History teachers. In addition, in-field History teachers were shown to be more experienced in teaching History compared to out-of-field History teachers.

(f) For Preferred Classroom Climate (CCP), the direct effect on CCP and TGender (teacher gender) indicated that students taught by female History teachers were more likely to prefer a classroom that had a high degree of personalisation participation, and investigation but less on the independence, and differentiation Students taught by older History teacher who were more experienced and more likely to be in-field, were more likely to be in classes in which, on average, students preferred more personalised, participation and investigation activities but less independent and differentiation activities in their History classroom. The results also indicated that classrooms that had high proportion of girls were more likely to prefer personalised, participation and investigative learning activities but less independent, and differentiation activities in their classroom environment, compared to those that classes had more boys.

(g) In relation to, Actual Classroom Climate the results indicated that students under Indian teachers, were more likely to experienced participation investigation and personalised learning activities, and less on the independence, and differentiation during in-field History There was also evidence that in-field History teachers were more likely to have classes in which students actually experienced more participation, investigation, and personalisation, but less independence, and differentiation, compared to out-of-field History teachers. The results also showed a negative relationship between Student Ethnic and Actual Classroom Climate. The negative sign indicated that non-Malay students such as Chinese, Indian and those of other ethnic backgrounds, experienced more participation, investigation, personalisation, and less independence, and differentiation learning activities in their actual History classroom.

(h) In relation to the variable Student Approaches to Learning, results showed that girls were more likely to adopt high order learning approaches. Furthermore, Student Ethnic had a direct effect on Student Learning. In other words, Indian students were more likely to adopt high order learning approaches than those of other backgrounds. These results provided evidence that the actual classroom environment of students was positively linked with the approaches to learning they adopted.

(i) Surface Learning Approach was influenced directly by Student Gender and Actual Classroom Climate. This result showed that actual classroom environment had a strong influence on students' adoption of surface learning. In addition, girls were more likely than boys to adopt surface learning approaches.

(j) In relation to, Achieving Learning Approaches (ACHIEV), the results showed that Surface learning approach had strong indirect effects on Achieving approach to learning.

This result suggested that students who experienced more Surface approaches to learning were more likely to adopt the achieving approaches in learning History. Another indirect factor was Surface. This result suggested that those students who adopted Surface approaches to learning were likely to employ Achieving approaches to learning during the History lesson.

(k) For Deep Learning Approach (DEEP), the results showed that the Achieving Approach to learning had the biggest direct effects, compared to students' ethnicity and actual classroom climate. This result indicated that students' with Achieving approach to learning were more likely to employ the DEEP approach to learning in the History classroom.

(l) In the case of the, Students' Perception of History learning (SOutcome), there were three LVs with the direct effects DEEP showed the largest direct effect compared to the other direct effects, Actual Classroom Climate and Surface learning approach. This result indicated that students who employed the DEEP learning approach were more likely to perceive that History learning outcomes had been achieved. In addition, students in classrooms where, on average, students adopted the Surface approach to learning were more likely to have positive perceptions of History learning outcomes.

In the case of the PLSPATH analysis of the students level data, both models investigated showed one comparatively small direct effect between Teachers' qualifications (out-of-field/in-field) and Students' History Learning Outcomes. The implication of the results is considered further in the concluding discussion of Chapter 10. The following chapter reports the results of the Hierarchical Linear Modeling (HLM) analysis which was carried out as the next stage of the investigation, to take account of the two levels of variables - teachers and students.

Chapter 9 Hierarchical Linear Modeling Analysis

9.1 Introduction

This chapter presents Hierarchical Linear Modeling (HLM) analysis: the procedure of HLM, model building, model trimming and the results of the HLM analysis. In the two previous chapters, single level path analyses were carried out using PLSPATH modeling. However, this study involves multilevel data where a number of students at the lower layer belonged to one classroom and a teacher in the upper layer. With data from two levels, HLM is an appropriate procedure to use for further analysis (Bryk & Raudenbush, 1992). As Braun, Jenkins, and Grigg (2006, p.6) affirmed, HLM is 'a class of techniques for analysing data having a hierarchical or nested structure'. Hence, HLM was employed in this study to examine the impacts of both student and teacher characteristics on students' approaches to learning and perceived History learning outcomes at students' level.

As mentioned in previous chapters the traditional approaches in to analysing two levels of data have a number of shortcomings such as violation of the independence of data assumptions, misestimated standard errors, as well as aggregation and disaggregation bias. Nalaya (2010, p.194), added that 'treating hierarchical data as single level data can lead to flawed findings and biased estimations of effects'. The use of HLM can overcome these limitations. In addition, HLM procedures make it possible to analyse variables at both levels (teachers and students) concurrently. In this study, Two-Level Hierarchical procedures were used to test the models. Level 1 is the student level and level 2 is the teacher level. HLM 6 program was used in this analysis (Bryk & Raudenbush, 1992).

9.2 Variables used in the model

HLM program Version 6 (Raudenbush, et al., 2004) does not provide the formation of latent variables (Darmawan, 2003). Therefore, SPSS 17 was used to calculate component scores for each construct involved in the models. As a result, according to Pedhazur (1997), most of the variables were in standardised forms, except for the variables of GENDER, AGE and TIN-FIELD. Additionally, Perdhazur (1997) added that standardised variables in the models allowed the direct comparison of coefficients of variables within the HLM models. In this study GENDER was a categorical variable, which was coded as Female = 1 and Male = 0. Variables SAGE and TAGE were used to record the teachers' and students' age in years. TINFIELD was the teachers' qualifications -'in-field' or 'out-of-field' History teachers.

This study aimed to examine relationships between teachers' and students' characteristics and perceptions on various constructs. Variables used in the HLM analysis were grouped into (a) students level variables, and (b) teachers' level variables. The list of variables used is presented in Table 9.1.

Variables at Level 1 (Students level) included :(a) students' characteristics (age, gender, ethnicity), (b) classroom climate Preferred, classroom climate Actual, (c) approaches to learning (Surface, Achieving and Deep approaches), and (d) students' perceptions of History learning (SOutcomes) in teaching and learning History in the classroom. At Level 2 (Teachers level), the variables tested were: (a) the teachers' individual characteristics (age, gender, ethnicity), (b) teacher qualifications (in-field and out-of-field); (c) teacher experience; (d) teacher conception, (e) teacher approaches and (f) History teaching methods variables.

Table 9. 1 List of Variables used in Two - Level HLM Models

Acronym	Description	Coding
Students' Level/Characteristic : Level-1		
SGDR	Student's Gender	1= Female 0=Male
SMALAY	Malay (Dummy)	1=Malay 0=Not Malay
SCHINESE	Chinese	1=Chinese 0=Not Chinese
SINDIAN	Indian	1=Indian 0=Not Indian
SCCA	Classroom Climate Actual	
SCCP	Classroom Climate Preferred	
SDEEP	Student's Approaches to Learning	
SACHIEVING	Student's Approaches to Learning	
SSURFACE	Student's Approaches to Learning	
Teachers' Level/Characteristic : Level-2		
TGDR	Teacher's Gender	1= Female 0=Male
TIN-FIELD	Teachers' Qualification	1= In-field 0= Out-of-field
TEXP	Teacher Experience	Years in teaching History
TMALAY	Malay (Dummy)	1=Malay 0=Not Malay
TCHINESE	Chinese	1=Chinese 0=Not Chinese
TINDIAN	Indian	1=Indian 0=Not Indian
SMALAY_M	Proportion of Malay student in the classroom.	
SCHINESE _M	Proportion of Chinese student in the classroom.	
SINDIAN_M	Proportion of Indian student in the classroom.	
SOTHER_M	Proportion of Others student in the classroom.	

Model Building

There are two main stages involved in the two-level HLM analysis: (a) fully unconditional model/ null model, and (b) conditional model.

The null model is similar to a one way ANOVA with random effect (Raudenbush & Byrk, 2002, p. 17). In other words, unconditional means that in this model no predictor variables are included at either levels (Raudenbush & Byrk, 2002). Furthermore, the null model provides information about the variability of the outcome variables at each level. The rationale for undertaking the null model is to obtain estimates of the amount of the variance available to be explained in the model (Raudenbush & Byrk, 2002). This model also estimates the confidence interval for the grand - mean. In this study, the null model was used to estimate the "amounts of variance in the criterion variable that operate at the difference levels of the specified model and that exist in the data" (Darmawan & Keeves, 2009, p. 55). This model was shown in the following equations:

Level 1 Model

$Y_{ij} = \beta_{0j} + r_{ij}$

[9.1]

where:

Y_{ij} is value of outcomes variable Y for student i in school *j;*

β_{0j} is a level -1 intercept; that is the mean value of outcome variable of school *j; and*

r_{ij} is a level - 1 random students effect; that is, the deviation of student i in school j score from school mean

The indexes i and j denote students and schools where there are

i=1, 2, N students within schools; and

j=1, 2, ..., J schools.

Level 2 Model

$B_{0j} = \gamma_{00} + u_{0j}$ [9.2]

where;

y_{00} is a level -2 intercept; that is the grand mean value of outcome variables across school and

u_{0j} is a level - 2 random school effect; that is the deviation of school *j* mean for the grand mean

Substituting the Level 2 equation into Level 1 equation yields the final model:

$$Y_{ij} = y_{00} + u_{0j} + r_{ij} \qquad [9.3]$$

The next step was to estimate the Level 1 model. At this stage, only the predictor variables (see Table 9.1) at the student level were added to the model. The predictor variables that were used in this model were taken from the results of the PLSPATH analyses presented in the previous chapters. These variables were entered into the equation, one by one. This procedure is defined as the 'step-up' approach. In contrast, the 'step-down' procedure is used when a tightly specified model is tested and non - significant variables are removed sequentially from the model. According to Darmawan & Keeves (2009, p. 56), the significance of an explanatory variable is commonly tested by requiring a relationship where the estimated regression coefficient is more than twice the estimated standard error, with some consideration given to the number of degrees of freedom.

There are three important considerations in this step. The first is the reliability of the estimated relationship. If the value is less 0.05, the parameter being estimated needs to be fixed. Secondly, the proportion of variance remaining to be explained for each criterion is generally tested with a chi-squared statistic. Thirdly, there is the issue of whether the inclusion of the variable in the model results in significant reduction in the deviance (Darmawan & Keeves, 2009).

The final step involves adding the Level 2 predictor variables. These variables can be examined using either procedures (step-up or step-down). At this stage, the step-up procedure is employed, beginning with the intercepts and then the regression slopes that have been estimated in previously. Each model is tested separately. The values of the coefficients, their standard error and the associated t-values are estimated. The predictor variables are added to the model one by one, with the highest t-value introduced first. There is subsequent exploratory testing of the Level 2 predictor variables that remain before inclusion in the model (Darmawan & Keeves, 2009).

Model Trimming

In this process, the estimated reliability coefficients are examined to check whether the intercepts or the slopes can either be 'fixed,' with the coefficient constrained to be the same across all level 2 units in the model, or remain 'random', which permits the coefficients to vary across the Level 2 units. Furthermore, if a relationship has a reliability value of less than 0.05, it indicates that the degree of error associated with the relationship is too high for effective analysis and there is no random effect. Therefore, the slope effects are treated as fixed.

A comparison between the null model and the final model provides an indicator of the amount of variance explained by the predictor variables at each level (Raudennbush & Bryk, 2002). According to Kek (2006, p. 247), 'the estimates of variance to be explained indicated the exploratory power of the final model'. She added that the value of the deviance was used to compare the goodness-of-fit between models. Darmawan and

Keeves (2006) affirmed that deviance is employed as a measure of fit of models of data, since the larger the deviance the poorer the fit of the model to the data. If the deviance value significantly lower in the final model compared to the null model, this result shows an improvement in the fit of the model. However, this test is best used when the Full Maximum Likelihood estimation procedure has been employed (Darmawan & Keeves, 2009).

9.3 HLM findings for Students' Approaches to Learning as the outcome variables

This section discusses the null model and the HLM results of the student approaches to learning variables; namely surface, achieving and deep. Three separate models were advanced using each of the three different learning approaches as the outcome in each of the respective models.

Table 9.2 presents the results of the three null models using the three different approaches as the outcome. The null models were tested to determine if HLM were necessary for the outcome specified.

Surface approach to learning

The null model results for the surface approach to learning showed that the reliability estimate for the surface approach was high at 0.65. The grand mean of surface approach was not significantly different from zero at the five percent level, with a probability value (p-value) of 0.862. This result indicated that the p-value was large enough for the intercepts to be considered equal to zero. Furthermore, the chi-square test for variance indicated that there was enough variance to be explained. Thus, this result indicates that it was worth carrying out a two-level HLM analysis.

The grand-mean result was 0.007, with a standard error of 0.04, indicating a 95% confidence interval of 0.007 ± 1.96 (0.04) = (-0.0714, 0.0854).

The estimated variance at level 2 of the surface approach to learning, represented by tau (τ), was 0.06. At level 2, according to Raudenbush & Bryk, (2002, p.36), the proportions of the variance in the surface approach to learning scores that was between level 2 units or the interclass correlation.

$\rho = \tau / (\sigma^2 + \tau) = 0.06 / (0.06 + 0.94) = 0.06$

The estimated value of variance between student's represented by sigma-square (σ^2) was 0.94. At the Level 1, the proportions of the variance in a surface approach to learning scores that existed between students was:

$\rho = \sigma^2 / (\sigma^2 + \tau) = 0.94 / (0.94 + 0.06) = 0.94$

These results demonstrated that most of variance in the surface approach to learning was at the student level (ρ = 0.94), with the variance at the teacher level being very small (ρ = 0.06), with the p-values of 0.00. The teachers-level effects accounted for 6% of the total variance in surface approach to learning, while the remaining 94% was related to between- student differences at the student level.

Achieving approach to learning

The reliability estimate of the null model for the Achieving approach was high at 0.69. The grand mean of the achieving approach was not significantly different from zero at the five percent level, with a probability value (p-value) of 0.761. This result indicated that the p-value was large enough for the intercepts to be considered equal to zero. Furthermore, the chi-square test for variance indicated that there was enough variance to be explained. Thus, this result indicated that it was worth carrying out a two-level HLM analysis on the achieving approach.

The grand-mean result was -0.013, with a standard error of 0.05, indicating a 95% confidence interval of -0.013 ± 1.96 (0.04) = (-0.0914, 0.0654). The estimated variance at level 2 of the surface approach to learning, represented by tau (τ), was 0.07. The estimated value of variance between students of achieving approach to learning, represented by sigma-square (σ^2) was 0.93.

Therefore, at Level 1, the proportion of the variance in a surface approach to learning scores that existed between the students' was:

$\rho = \sigma^2 / (\sigma^2 + \tau) = 0.93 / (0.93 + 0.07) = 0.93$

According to Raudenbush & Bryk,(2002 , p.36) , at level 2, the proportion of the variance in the achieving approach to learning scores was between level 2 units or the interclass correlation.

$\rho = \tau /(\sigma^2 + \tau) = 0.07 / (0.07 + 0.93) = 0.07$

These results indicated that most of variance in the achieving approach to learning was at the students' level ($\rho = 0.93$), while the variance at the teachers' level was only $\rho = 0.07$, with the p-values of 0.00. In other words, the teacher-level effects accounted for 7% of the total variance in achieving approach to learning, while remaining 93% was related to between- student differences at the student level.

Deep approach to learning

The results from the null model for the deep approach to learning reveal that the estimated reliability was 0.65. This result indicated a low degree of error. The grand mean for the deep approach was not significantly different from zero at the five percent level, with a probability value (p-value) of 0.794. In other words, these results indicated that the probability was large enough for the intercepts to be considered to be equal to zero, while the Chi-square test for the variance indicated that there was enough variance to be explained.

The results from Table 9.2 for deep approach showed that the grand-mean for this approach was -0.011, with standard error of 0.04 indicating a 95% confidence interval of -0.011 ± 1.96 (0.04) = (-0.089,0.067). In this analysis the estimated value of variance at level 2 of the deep approach to learning, represented by tau (τ), was 0.06. At level 2, following Raudenbush & Bryk,(2002, p.36)the proportions of the variance in the deep approach to learning scores that was between level 2 units or the interclass correlation.

$\rho = \tau / (\sigma^2 + \tau) = 0.06 / (0.06 + 0.94) = 0.06$

The estimated value of variance between students of deep approach to learning, represented by sigma-square (σ^2) was 0.94. At Level 1, the proportion of the variance in a surface approach to learning scores that existed between the students was:

$\rho = \sigma^2 / (\sigma^2 + \tau) = 0.94 / (0.94 + 0.06) = 0.94$

Those results indicated that most of variance in the achieving approach to learning were at students' level ($\rho = 0.94$), with the variance in the teachers' level being only ($\rho = 0.06$), with the p-values of 0.00. In other words, the teacher-level effects accounted for only 6%

of the total variance in deep approach to learning, while the remaining 94% was related to between- student differences at the student level.

Table 9. 2 Null Models Results for Approaches to Learning

Outcome	Reliability Estimate	Fixed Effect	Coefficient	Standard Error	T-ratio	df	p-value
Surface Approach to learning (SA)	0.65	Intercept 1 for SA,B0					
		INTRCPT2, G00	0.007	0.04	0.18	51	0.862
		Random Effect	Standard Deviation	Varian Component	Df	Chi-square	p-value
		Intercept 1 for SA,U0	0.24949	0.06	51	156.86	0.00
		Level 1, R	0.96	0.94			
		Interclass Correlation		Deviance			
		$\tau = 0.06$ $\sigma^2 = 0.94$ $\rho = \tau / (\tau + \sigma^2) = 0.06$ (6%)		4647.30 for 2 parameters			
Deep Approach to learning (DA)	0.65	Intercept 1 for DA,B0					
		INTRCPT2, G00	-0.011	0.04	-0.26	51	0.794
		Random Effect	Standard Deviation	Varian Component	Df	Chi-square	p-value
		Intercept 1 for DA,U0	0.25131	0.06	51	166.40	0.00
		Level 1, R		0.94			
			0.96				
		Interclass Correlation		Deviance			
		$\tau = 0.06$ $\sigma^2 = 0.94$ $\rho = \tau / (\tau + \sigma^2) = 0.06$ (6%)		4638.06 for 2 parameters			
Achieving Approach to learning (AA)	0.69	Intercept 1 for AA,B0					
		INTRCPT2, G00	-0.013	0.05	-0.30	51	0.761
		Random Effect	Standard Deviation	Varian Component	df	Chi-square	p-value
		Intercept 1 for AA,U0	0.27162	0.07	51	188.00	0.00
		Level 1, R	0.96	0.93			
		Interclass Correlation		Deviance			
		$\tau = 0.07$ $\sigma^2 = 0.93$ $\rho = \tau / (\tau + \sigma^2) = 0.07$ (7%)		4624.18 for 2 parameters			

9.4 Final Results for the Approaches to Learning as the outcome variables

This section discusses on the final HLM results for the three learning approaches namely surface, achieving and deep approaches. HLM version 6.0 was used to explore the possible variables at Level 2 that could have significant effects. Step up procedure was used until the final model, which with only the significant effects at both levels, was obtained. The results of the fixed effect are presented first, followed by the explanation of the results of variance. In all three models there was no cross-level interaction or moderating effect on the variables.

Surface approach to learning

The final results for the surface approach to learning, which are summarized in Table 9.3 is specified by the following equation: format:

Level 1 Model

$$Y_{ij} = \beta_{0j} + \beta_{1j} *(\text{SCHINESE}) + \beta_{2j} *(\text{SCCP}) + r_{ij} \qquad [9.4]$$

Level 2 Model

$$\beta_{0j} = \Upsilon_{00} + \gamma_{01}* (\text{TIN-FIELD}) + u_{0j} \qquad [9.5]$$

$$\beta_{1j} = \gamma_{10} + u_{1j} \qquad [9.6]$$

$$\beta_{2j} = \gamma_{20} + u_{2j} \qquad [9.7]$$

By substituting level-2 equations (Equations 9.4 to 9.7) into level-1, the final model is represented by.

$$Y_{ij} = (\Upsilon_{00} + \gamma_{01} (\text{TIN-FIELD}) + u_{0j}) + (\gamma_{10} + u_{1j}) (\text{SCHINESE}) + (\gamma_{20} + u_{2j}) (\text{SCCP}) + r_{ij} \qquad [9.8]$$

The final model as expressed in Equation 9.8 illustrates that the implementation of the surface approach to learning was a function of the overall intercept (Y_{00}), three main effects, and a random error ($u_{0j} + u_{1j}$ (SCHINESE) + u_{2j} (SCCP) + rj). The three main effects were the direct effects from TIN-FIELD (teacher in-field/out-of-field) at level 2 and SCHINESE and SCCP at level 1 (students'). There was no cross-level interaction or moderating effect between level 1 and level 2 variables.

Table 9. 3 Final Model of Surface Approach to Learning

Final estimation of fixed effect (wt robust standard errors)					
Fixed Effect	Coefficient	Standard Error	T-ratio	Approx. Df	P-value
For INTRCPT2, B0					
INTRCPT2, G00	0.23	0.05	4.63	50	0.000
TIN-FIELD, G01	-0.20	0.06	-3.61	50	0.001
For SCHINESE slope, B2					
INTRCPT2, G10	-0.41	0.08	-5.12	51	0.000
For SCCP slop, B2					
INTRCPT2, G20	0.13	0.04	3.23	51	0.003

Final estimation of variance components					
Random Effect	Standard Deviation	Variance Component	DF	Chi-square	P-value
INTRCPT1, U0	0.23	0.05	40	89.830	0.000
SCHINESE slope, U1	0.44	0.19	41	86.056	0.000
SCCP slope, U2	0.21	0.04	41	109.831	0.000
Level-1, R	0.91	0.83			

Statistics for current covariance components model	
Deviance	4511.31
Number of estimate parameter	7

Fixed Effects

The Figure 9.1 shows the final two level hierarchical model for surface learning as the outcome variable.

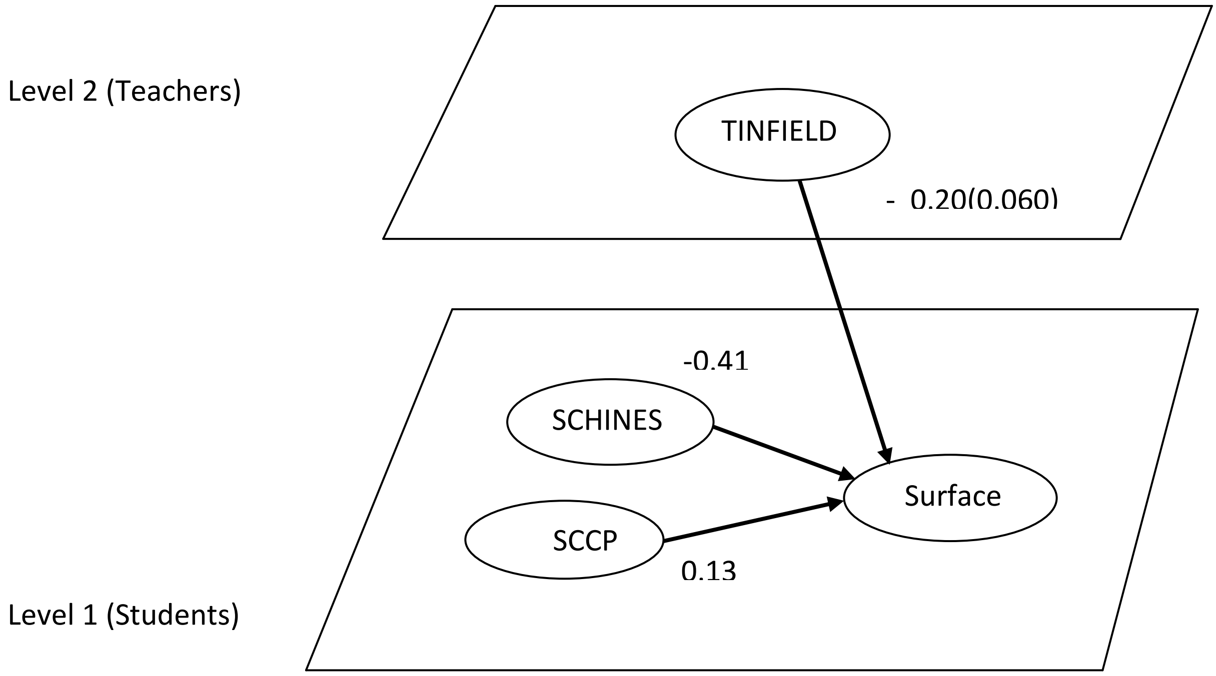

Figure 9. 1 Final Two-level HLM model for Surface Approach to Learning

As presented in Figure 9.1 and Table 9.3, the surface approach to learning was influenced directly at level 1 (student level) by SCHINESE (γ= -0.41) and SCCP (γ= 0.13).

SCHINESE effects on Surface (-0.41/ 0.080)

Chinese ethnicity has a negative effect on the surface approach to learning (-0.41). This negative effect indicates that the Chinese students were less likely to employ surface approach in learning History in comparison to students of Malay, Indian and other ethnicities in the History classroom.

CCP effects on Surface (0.13/ 0.040)

Students' preferred History classroom climate had a positive effect on the surface approaches to learning. The findings reveal that the students preferred personalized and participation activities in the History classroom. This indicates that the more the classroom climate is in line with what the students preferred the more students tend to use surface approach.

Effects of TIN-FIELD on Surface (-0.20/ 0.060)

At the level 2 (teacher level), only one variable had a direct effect on surface approach to learning. The analysis shows that teacher INFIELD (γ = -0.20) had negative effects on the surface approach to learning. This finding indicates that students in the classroom taught by in-field History teachers are less likely to adopt a surface approach to learning.

Goodness-of-Fit, Variance Partitioning and Variance Explained

The proportions of variance explained by the final model of student and teacher levels are presented in Table 9.4. The percentages of variance of scores at both levels were the maximum amount of variance available at those levels that were subsequently explained in the HLM analyses. The results indicated that most of the variance (94%) was found between students and only 6% occurred between teachers. The final model explained (12%) of the variance available at the level 1 and (17%) of variance at level 2. Overall the total amount of variance explained by the final model was 12%.

Table 9. 4 Estimation of Variance Component and Explained Variance for Surface Approach to Learning

	Estimation of variance component between:	
	Students	Teachers
Number of cases	1653	52
Null Model	0.94	0.06
Final Two – level HLM Model	0.83	0.05
Variance at each level	$\frac{0.94}{0.06 + 0.94}$ = 94 %	$\frac{0.06}{0.06 + 0.94}$ = 6 %
Proposition of variance explained By final Two - Level Model	$\frac{0.94 - 0.83}{0.94}$ = 12%	$\frac{0.06 - 0.05}{0.06}$ = 17 %
Overall variance explained	$\frac{(0.94 - 0.83) + (0.06 - 0.05)}{(0.94 + 0.06)}$ =12%	

The final model's goodness-of-fit, presented in Table 9.2 and 9.3, showed that the deviance was reduced by 112.87, from 4624.18 in the null model to 4511.31 in the final model, with an additional 2 degrees of freedom.

Deep approach to learning

The final results for the deep approach to learning are specified by the following equations:

Level 1 Model

$Y_{ij} = \beta_{0j} + \beta_1$ *(SGDR) + β_{2j} *(SCHINESE) + β_{3j} *(SCCP) + β_{4j} *(SCCA) + r_{ij}

[9.9]

$$\beta_{0j} = Y_{00} + \gamma_{01} * (TYRTEAC) + u_{0j} \quad [9.10]$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} *(SURFACE) + \gamma_{12} *(ACHIEVING) + u_{1j} \quad [9.11]$$

$$\beta_{2j} = \gamma_{20} + u_{2j} \quad [9.12]$$

$$\beta_{3j} = \gamma_{30} + u_{3j} \quad [9.13]$$

$$\beta_{4j} = \gamma_{40} + u_{4j} \quad [9.14]$$

By substituting level-2 equations (Equations 9.9 to 9.14) into level-1, the final model is represented by:

$$Y_{ij} = Y_{00} + \gamma_{01} (TYRTEAC) + u_{0j}) + (\gamma_{10} + \gamma_{11} (SURFACE) + \gamma_{12} (ACHIEVING) + u_{1j}) (SGDR) + (\gamma_{20} + u_{2j}) (SCHINESE) + (\gamma_{30} + u_{3j}) (SCCP) + (\gamma_{40} + u_{4j}) (SCCA) + r_{ij} \quad [9.15]$$

The final model as expressed in Equation 9.15 illustrates that the implementation of a deep approach to learning was a function of the overall intercept (Y_{00}), seven main effects, and a random error ($u_0 + u_1$ (SGDR) + u_2 (SCHINESE) + u_3 (SCCP) + u_4 (SCCA) + r). The seven main effects were the direct effects from TYRTEAC, SURFACE and ACHIEVING at level 2 and SGDR, SCHINESE, SCCP, and SCCA at level 1. There was no cross-level interaction or moderating effect between level 1 and level 2 variables.

Table 9. 5 Final Model of Deep Approach to Learning

Final estimation of fixed effect (wt robust standard errors)						
Fixed Effect		Coefficient	Standard Error	T-ratio	Approx. Df	P-value
For INTRCPT1,	B0					
INTRCPT2,	G00	-0.13	0.07	-0.84	50	0.071
TYRTEA	G01	-0.005	0.001	-2.73	50	0.009
For SGDR slope,	B1					
INTRCPT2,	G10	0.14	0.05	3.10	49	0.004
SURFACE	G11	-0.11	0.04	-2.76	49	0.009
ACHIEVING	G12	0.37	0.04	8.75	49	0.000
For SCHINESE slope,	B2					
INTRCPT2,	G20	-0.42	0.07	-5.72	51	0.000
For SCCP slope,	B3					
INTRCPT2,	G30	0.25	0.03	7.55	51	0.000
For SCCP slope,	B4					
INTRCPT2,	G40	0.14	0.02	6.51	51	0.000

Final estimation of variance components						
Random Effect		Standard Deviation	Variance Component	DF	Chi-square	P-value
INTRCPT1,	U0	0.20	0.04	41	45.33	0.30
SGDR slope,	U1	0.15	0.02	39	46.90	0.18
SCHINESE slope,	U2	0.37	0.13	41	77.91	0.00
SCCP slope,	U3	0.16	0.02	41	78.75	0.00
SCCA slope,	U4	0.05	0.00	41	37.92	>.50
Level-1,	R	0.83	0.70			

Statistics for current covariance components model	
Deviance	4188.39
Number of estimate parameter	16

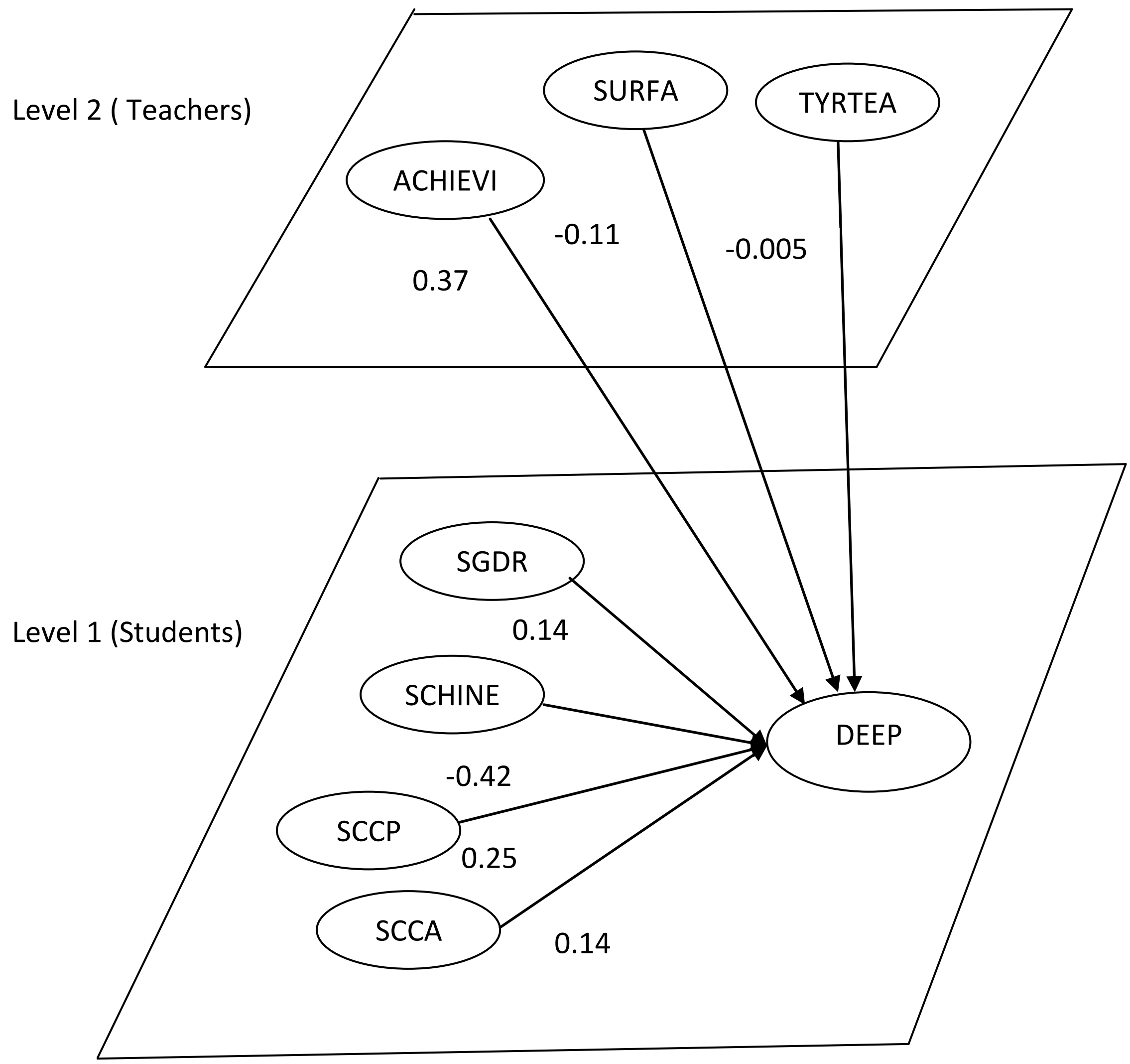

Figure 9. 2 HLM model for Deep Approach to Learning

As shown in Figure 9.2, based on final results in Table 9.5, a deep approach to learning was influenced directly at student level by SGRD (γ= 0.41) , Chinese (γ= -0.41) , CCP (γ= 0.26) and CCA (γ= 0.14).

SGDR effects on DEEP

In term of students' gender SGDR *(0.41/ 0.045)*, the result indicates that the female students were more likely to adopt a deep learning approach compared to male students.

SCHINESE effects on DEEP

In term of the students' ethnicity, Chinese students showed direct negative effects (-0.42/00.71) on the deep approach to learning. This result indicated that Chinese students were less likely to employ deep approach for the learning of History than students of Malay, Indian and Other ethnicities.

CCP effects on DEEP and CCA effects on DEEP

Students' preferred History classroom climate (CCP) (0.25/ 0.033) and actual classroom climate (CCA) (0.14/ 0.022) both had a positive effect on the deep approach to learning. This suggested that the more the classroom climate was in line with what the students preferred and what they actually experienced, the more likely the students were to use a deep approach to learning.

The HLM analyses also indicated that all the variables at the student level were significant at $p = 0.004$ for (students' gender) and, $p = 0.000$ for (ethnicity, CCP and CCA). Overall, these findings highlight that both actual and preferred classroom environments as well as, students' gender and ethnicity had an important influence on the deep learning approach.

At the teachers' level, a direct influence on deep approach to learning came from three factors TYRTEA (γ= -0.005), SURFACE (γ= -0.11) and ACHIEVING (γ= 0.38).

TYRTEA effects on DEEP

The results shows years of teaching (teacher experience) had a direct negative effect (-0.005/ 0.002) on deep approach to learning. This indicated that students under teachers who had more experience were less likely to adopt deep approach compared to those under novice History teachers. Students under the novice History teachers were more likely to employ deep approach to learning in the History classroom.

SURFACE effects on DEEP

In addition, students in classrooms, where, on average students used a surface approach to learning (-0.11/ 0.038), were less likely to adopt a deep approach.

ACHIEVING effects on DEEP

In contrast, students in classrooms where, on average, students employed and achieving approach to learning were more likely to use a Deep approach to learning History (0.38/ 0.043).

The impacts for TYRTEA (-0.005) and SURFACE (-0.11) were small compared to ACHIEVING (0.38). Furthermore, all the variables at the teacher level were substantially significant at $p = 0.009$ for TYRTEA and for SURFACE, and $p = 0.000$ for ACHIEVING. In summary, these teachers variables indicated that the teachers' experience and approaches toward teaching and learning History effected whether students adopted a deep approach to learning History.

Goodness-of-Fit, Variance Partitioning and Variance Explained

The proportions of variance in the final model at Level 1 and Level 2 are presented in Table 9.6 HLM analysis demonstrated that the percentage of variance of scores at the students' and teachers' levels of the hierarchy were the maximum amount of variance available at those levels. Based on the results in Table 9.6, the total amount of variance explained by the final model was 25%. Most of the variance (94%) was found between students, while 6% occurred at teachers' level. The final model explained (23%) of the variance available at the level 1 and (33%) of variance at teachers' level.

Table 9. 6 Estimation of Variance Component and Explained Variance for Deep Approach to Learning

	Estimation of variance component between:	
	Students	Teachers
Number of cases	1653	52
Null Model	0.93	0.06
Final Two – level HLM Model	0.70	0.04
Variance at each level	$\frac{0.93}{0.06 + 0.93}$ = 94 %	$\frac{0.06}{0.06 + 0.93}$ = 6 %
Proposition of variance explained By final Two - Level Model	$\frac{0.93 - 0.70}{0.93}$ = 23%	$\frac{0.06 - 0.04}{0.06}$ = 33 %
Overall variance explained	$\frac{(0.93 - 0.70) + (0.06 - 0.04)}{(0.93 + 0.06)}$ =25%	

The final model's goodness-of-fit as, presented in Tables 9.2 and 9.5 showed that, the deviance was reduced by 449.67, from 4638.07 in the null model to 4188.40 in the final model, with an additional 14 degrees of freedom.

Achieving approach to learning

The final result for the achieving approach to learning is specified by the following equation: format:

Level 1 Model

$$Y_{ij} = \beta_{0j} + \beta_{1j} *(SGDR) + \beta_{2j} *(SMALAY) + \beta_{3j} *(SCHINESE) + \beta_{4j} *(SCCP) + \beta_{5j} *(SCCA) + rij$$

[9.16]

Level 2 Model

$\beta_{0j} = Y_{00} + \gamma_{01}$* (SMALAY_M) + $_{U0j}$ [9.17]

$\beta_{1j} = \gamma_{10} + \gamma_{11}$*(SDEEP) + $_{U1j}$ [9.18]

$\beta_{2j} = \gamma_{20} + _{U2j}$ [9.19]

$\beta_{3j} = \gamma_{30} + _{U3j}$ [9.20]

$\beta_{4j} = \gamma_{40} + _{U4j}$ [9.21]

$\beta_{5j} = \gamma_{50} + _{U5j}$ [9.22]

By substituting level-2 equations (Equations 9.16 to 9.22) into level-1, the final model is represented by:

Y_{ij} = ($Y_{00} + \gamma_{01}$ (SMALAY_M + $_{u0j}$) + ($\gamma_{10+}\gamma_{11}$ (SDEEP) + u_{1j}) (SGDR) + ($\gamma_{20\,+\,u2j}$) (SMALAY) + (γ_{30} $_{+}$ u_{3j} (SCHINESE) + ($\gamma_{40\,+}$ u_{4j}) (SCCP) + ($\gamma_{50} + u_{5j}$) (SCCA) + r_{ij}

[9.23]

The final model as expressed in Equation 9.23 illustrates that the implementation of the achieving approach to learning was a function of the overall intercept (Y_{00}); there were seven main effects and a random error ($u_0 + u_1$ (SGDR) + u_2 (SMALAY) + u_3 (SCHINESE) + u_4 (SCCP) + u_4 (SCCA) + r). The seven main effects were the direct effects from SMALAY_M, and SDEEP at level 2 and SGDR, SMALAY, SCHINESE, SCCP, and SCCA at level 1. There was no cross-level interaction or moderating effect between level 1 and level 2 variables.

Table 9. 7 Final Model of Achieving Approach to Learning

Final estimation of fixed effect (wt robust standard errors)						
Fixed Effect		**Coefficient**	**Standard Error**	**T-ratio**	**Approx. Df**	**P-value**
For INTRCPT1,	B0					
INTRCPT2,	G00	-0.22	0.08	-2.77	50	0.008
SMALAY_M	G01	-0.23	0.09	-2.34	50	0.023
For SGDR slope,	B1					
INTRCPT2,	G10	0.20	0.05	4.10	50	0.000
SDEEP	G11	0.36	0.04	8.63	50	0.000
For SMALAY slope,	B2					
INTRCPT2,	G20	0.18	0.08	2.20	51	0.032
For SCHINESE slope,	B3					
INTRCPT2,	G30	-0.32	0.08	-4.19	51	0.000
For SCCPAM slope,	B4					
INTRCPT2,	G40	0.26	0.04	7.18	51	0.000
For SCCPAM slope,	B5					
INTRCPT2,	G50	0.13	0.02	5.60	51	0.000

Final estimation of variance components						
Random Effect		**Standard Deviation**	**Variance Component**	**DF**	**Chi-square**	**P-value**
INTRCPT1,	U0	0.20	0.04	32	32.57	0.44
SGDR slope,	U1	0.18	0.03	32	44.51	0.07
SMALAY	U2	0.22	0.05	33	38.46	0.24
SCHINESE slope,	U3	0.28	0.08	33	35.77	0.34
SCCP slope,	U4	0.19	0.04	33	70.30	0.00
SCCA slope,	U5	0.07	0.004	33	35.26	0.40
Level-1,	R	0.81	0.70			

Statistics for current covariance components model	
Deviance	4127.11
Number of estimate parameter	22

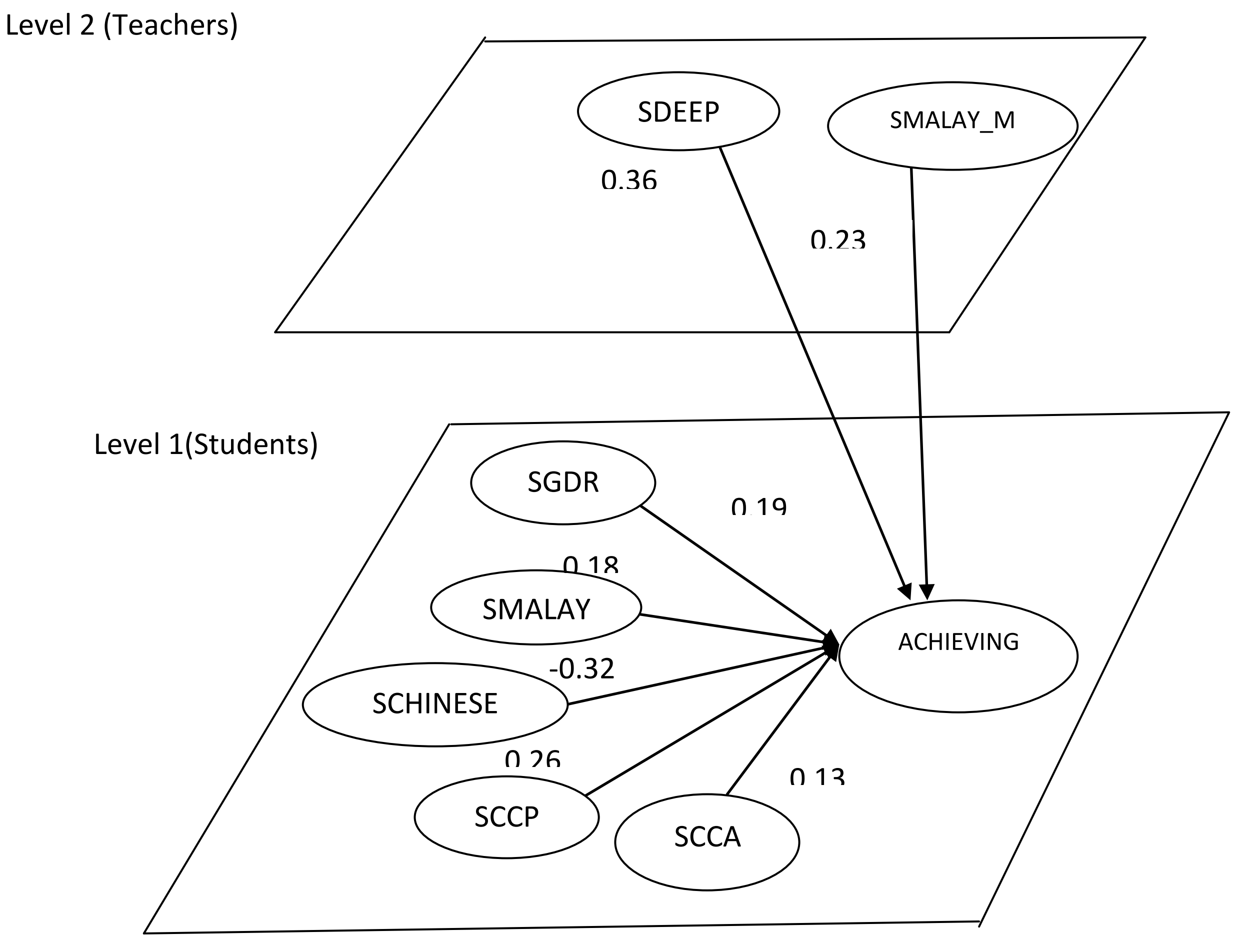

Figure 9. 3 HLM model for Achieving Approach to Learning

The final results in Table 9.7, as presented in Figure 9.3, revealed that an acheiving approach to learning was influenced directly at student level by SGRD (β= 0.19) , SMalay (β= -0.18), SChinese (β= -0.32) , CCP (β= 0.26) and CCA (β= 0.13).

SGDR had a positive effect on Achieving approach to learning (0.19/0.047) This result indicated that the female students were more likely to employ the achieving approach to learning compared to male students.

SMALAY effects on Achieving approach to learning

The results revealed that Malay student (SMALAY) had a positive effect (0.18/0.081) on the achieving approach to learning. This result indicates that the Malay students were more likely adopt the achieving learning approach compared to student of Chinese, Indian and Other ethnicities.

SCHINESE effects on Achieving approach to learning

Students' of Chinese ethnicity had a negative direct influence(-0.32/0.077) on the achieving approach. The results reveal that Chinese students'were less likely to employ the achieving approach compared to non-Chinese students'.

CCP and CCA effects on Achieving approach to learning

Students' preferred History classroom climate (CCP) (0.26/0.036) and actual classroom climate (CCA) (0.13/0.022) had a positive effects on the achieving approach to learning. These indicated that the more the classroom climate was in line with what the students preferred and what they actually experienced the more likely they were to use the achieving approach to learning.

The HLM analyses also indicated that all the variables at the student level were significant at $p = 0.000$ for (SGDR, SCHINESE, CCP and CCA), $p = 0.032$ for (SMALAY). Overall these findings highlighted that both actual and preferred History classroom climates as well as, students' gender and ethnicity influenced students' use of an achieving learning approach in the History classroom.

At level 2 (the teacher level), there were two variables which had direct effects on the achieving approach to learning: SMALAY_M (γ= 0.23) and DEEP (γ= 0.36). The results show that both variables had positive influence on the achieving approach.

SMALAY_M effects on Achieving approach to learning

The result showed the proportion of Malay students (SMALAY_M) in the classroom had a positive effect (0.23/0.096) on the achieving approach to learning. This indicates that the students in a classroom that had higher proposition of Malay students were likely to adopt an achieving approach to learning.

SDEEP effects on Achieving approach to learning

These results showed that SDEEP had a direct positive effects $(0.36/0.041)$ on the achieving approach to learning. This indicated that, students in the classroom that had higher proportion of students adopting deep approach to learning were more likely to use achieving approach to learning in the History classroom.

Goodness-of-Fit, Variance Partitioning and Variance Explained

The proportions of variance explained by the final model at students and teachers level are presented in Table 9.8. The percentages of variance of scores at both levels were the maximum amounts of variance available at those levels that were subsequently explained in the HLM analyses. The results indicate that most of the variance (93%) was found between students' variable and 7% occurred between teachers' variables. The final model explained (27%) of the variance available at the level 1 and (43%) of variance at teachers' level. Overall, the total amount of variance explained by the final model was 28%.

Table 9. 8 Estimation of Variance Component and Explained Variance for Achieving Approach to Learning

	Estimation of variance component between:	
	Students	Teachers
Number of cases	1653	52
Null Model	0.92	0.07
Final Two – level HLM Model	0.67	0.04
Variance at each level	$\frac{0.92}{0.07 + 0.92}$ = 93%	$\frac{0.07}{0.07 + 0.93}$ = 7%
Proposition of variance explained By final Two - Level Model	$\frac{0.92 - 0.67}{0.92}$ = 27 %	$\frac{0.07 - 0.04}{0.07}$ = 43 %
Overall variance explained	$\frac{(0.92 - 0.67) + (0.07 - 0.04)}{(0.92 + 0.07)}$ = 28 %	

In the final estimations goodness-of-fit model, presented in Table 9.7 and 9.8, the deviance was reduced by 497.07, from 4624.18 in the null model to 4127.11 in the final model, with an additional 20 of degrees of freedom.

9.5 HLM finding for the Students' Learning Outcome as the outcome variable

This section discusses the result of HLM-two level analysis of the student learning outcome (SOUTCOME). The discussion is focussed on the effects of the students' and teachers' characteristics on students' learning outcome.

Table 9.9 presents the results of the null model for student learning outcomes (SOUTCOMES). The null model was tested to determine if HLM were necessary for the outcome specified.

Table 9. 9 Null Model Results for the Students' Learning Outcomes (SOUTCOME)

Outcome	Reliability Estimate	Fixed Effect	Coefficient	Standard Error	T-ratio	df	p-value
Student Learning Outcome (SOUTCOME)	0.76	Intercept 1 for SOUTCOME,B0					
		INTRCPT2, G00	-0.016	0.05	-0.31	51	0.753
		Random Effect	Standard Deviation	Varian Component	df	Chi-square	p-value
		Intercept 1 for SOUTCOME,U0	0.32666	0.10	51	254.61	0.000
		Level 1, R	0.94	0.89			
		Interclass Correlation		Deviance			
		$\tau = 0.10$ $\sigma^2 = 0.89$ $\rho = \tau / (\tau + \sigma^2) =$ 0.10 (10%)		4580.16 for 2 parameters			

The reliability estimate of the null model of the students' learning outcome was high at 0.76. The grand mean of students learning outcome (SOUTCOME) was not significantly different from zero at the five percent level with the probability value (p-value) of 0.761. This result indicated that the p-value was large enough for the intercepts to be considered equal to zero. Furthermore, the chi-square test for variance indicated that there was enough variance to be explained. Thus, this result indicated that it was worth carrying out a two-level HLM analysis.

The grand-mean result was -0.016, with the standard error of 0.05, indicating a 95% confidence interval of -0.016 ± 1.96 (0.04) = (-0.0944, 0.0624). The estimated variance at level 2 of the SOUTCOME, represented by tau (τ), was 0.10. The estimated value of variance between students of surface approach to learning, represented by sigma-square (σ^2) was 0.89.

According to Raudenbush & Bryk, (2002, p.36), at level 2, the proportions of the variance in the SOUTCOME scores that was between level 2 units or the interclass correlation was:

$\rho = \tau / (\sigma^2 + \tau) = 0.10 / (0.10 + 0.89) = 0.10$

Therefore, at Level 1, the proportions of the variance in students' learning outcomes scores that existed between the students was:

$\rho = \sigma^2 / (\sigma^2 + \tau) = 0.89 / (0.89 + 0.10) = 0.90$

These results indicated that most of variance in the students learning outcomes was at students' level ($\rho = 0.90$), and the variance in the teachers level ($\rho = 0.10$), with the p-values of 0.00. In other words, the teacher-level effects accounted for 10% of the total variance students' learning outcomes, while the remaining 90% was related to between-student differences at the students' level 1.

9.6 Final Result for the Students' Learning Outcomes as the outcome variables

This section discusses the final HLM results for the students' learning outcome. The step by step procedure was used at this stage, until the final model with only the significant effects at both levels was obtained. The discussion is on the fixed effect and is followed by an explanation of the results of variance. In this model there were no cross-interaction results or moderating effects on these variables.

Students' Learning Outcomes

The final result for the student learning outcome (SOUTCOME) was specified by the following equations:

Level 1 Model

$Y_{ij} = \beta_{0j} + \beta_{1j}$ *(SMALAY) + β_{2j} *(SINDIAN) + β_{3j} *(SCCP) + β_{4j} *(ACHIEVING) β_{3j} *(SDEEP) + rij

[9.24]

Level 2 Model

β_{0j} = Y_{00} + γ_{01}* (TCHINESE) + $_{U0j}$ [9.25]

β_{1j} = γ_{10} + $_{U1j}$ [9.26]

β_{2j} = γ_{20} + $_{U2j}$ [9.27]

β_{3j} = γ_{30} + $_{U3j}$ [9.28]

β_{4j} = γ_{40} + $_{U4j}$ [9.29]

β_{5j} = γ_{50} + $_{U5j}$ [9.30]

By substituting level-2 equations (Equations 9.24 to 9.30) into level-1, the final model is represented by:

Y_{ij} = (Y_{00} + γ_{01} (TCHINESE) + u_{0j}) + (γ_{10} + u_{1j}) (SMALAY) + (γ_{20} + u_{2j}) (SINDIAN) + (γ_{30} + u_{3j}) (SCCP) + (γ_{40} + u_{4j}) ACHIEVING) + (γ_{50} +u_{5j})(SDEEPAM)+ r_{ij}

[9.31]

The final model, as expressed in Equation 9.31, illustrates that the implementation of students' learning outcomes (SOUTCOME) was a function of the overall intercept (Y_{00}), six main effects and a random error (u_0 + u_1 (SMALAY) + u_2 (SINDIAN) + u_3 (SCCP) + u_4

(ACHIEVING) + u_5 (SDEEP) + r). The six main effects were the direct effects from TCHINESE at level 2 and SMALAY, SINDIAN, SCCP, ACHIEVING and SDEEPAM, at level 1. There were no cross-level interactions or moderating effects between level 1 and level 2 variables.

Table 9. 10 Final Model of Students' Learning Outcomes (SOUTCOME)

Final estimation of fixed effect (wt robust standard errors)						
Fixed Effect		**Coefficient**	**Standard Error**	**T-ratio**	**Approx. Df**	**P-value**
For INTRCPT1,	B0					
INTRCPT2,	G00	-0.30	0.04	-7.73	50	0.000
TCHINESE	G01	-0.29	0.08	3.85	50	0.000
For SMALAY slope,	B1					
INTRCPT2,	G10	0.38	0.05	8.21	51	0.000
For SINDIAN slope,	B2					
INTRCPT2,	G20	0.27	0.08	3.56	51	0.001
For SCCPAM slope,	B3					
INTRCPT2,	G30	0.12	0.02	6.12	51	0.000
For ACHIEVING slope,	B4					
INTRCPT2,	G40	0.34	0.06	5.74	51	0.000
For SDEEPAM slope,	B5					
INTRCPT2,	G50	0.23	0.06	4.10	51	0.000
Final estimation of variance components						
Random Effect		**Standard Deviation**	**Variance Component**	**DF**	**Chi-square**	**P-value**
INTRCPT1,	U0	0.10	0.01	29	27.63	>.50
SMALAY slope,	U1	0.13	0.02	30	32.62	0.34
SINDIAN slope,	U2	0.12	0.02	30	20.91	>.50
SCCPAM slope,	U3	0.05	0.002	30	34.94	0.24
ACHIEVING slope,	U4	0.18	0.03	30	33.22	0.31
SDEEPAM slope,	U5	0.16	0.03	30	27.24	>.50
Level-1,	R	0.70	0.49			
Statistics for current covariance components model						
Deviance		3583.76				
Number of estimate parameter		22				

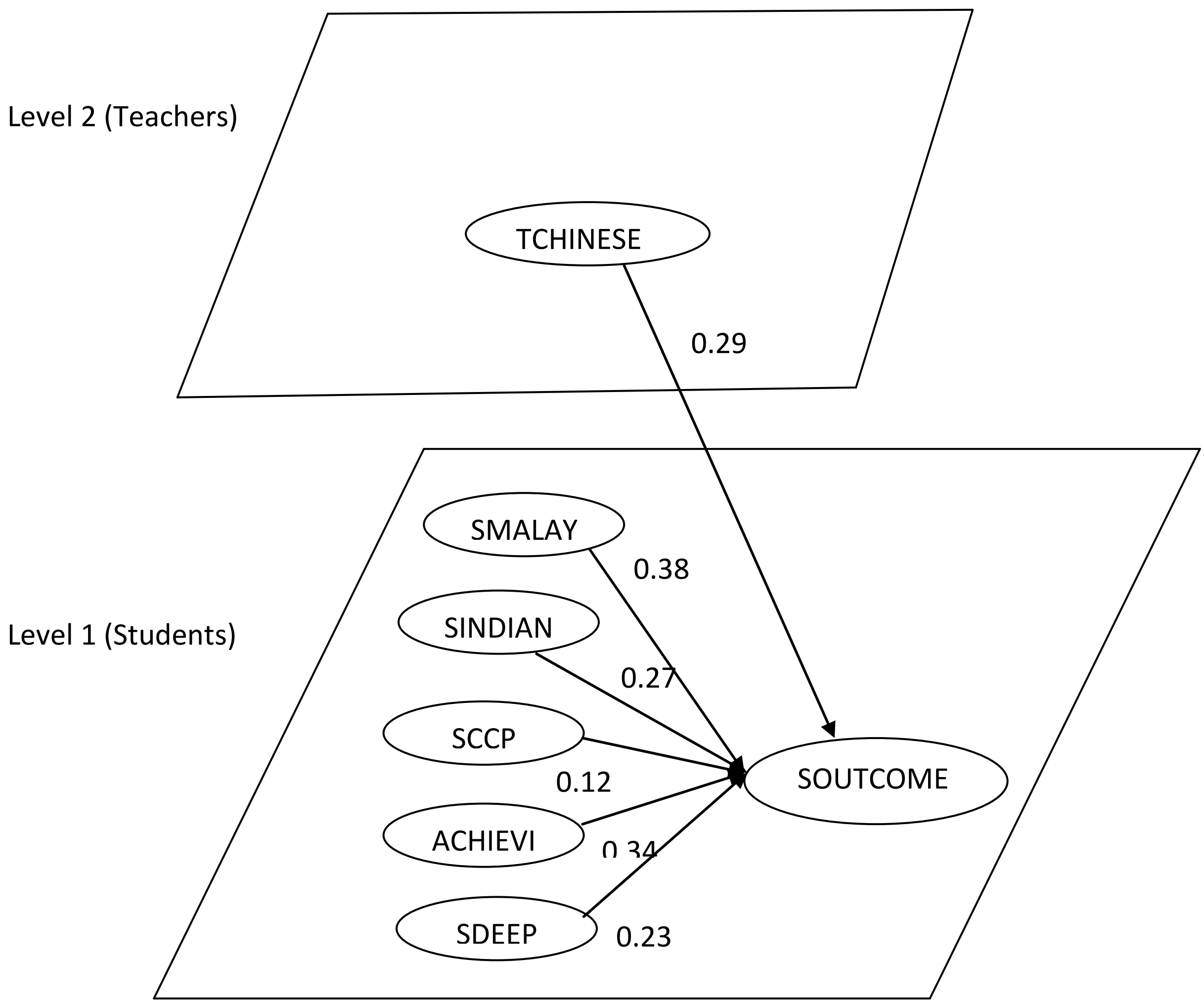

Figure 9. 4 HLM model for Students' Learning Outcomes (SOUTCOME)

Table 9.9 and Figure 9.4 show that students' learning outcomes was influenced directly at student level by SMALAY (β= 0.37), SINDIAN (β= 0.27), SCCP (β= 0.12), ACHIEVING (β= 0.34) and SDEEP (β= 0.23).

SMALAY effects on Studens' Learning Outcomes

The results show that being a Malay student had a positive direct effect (0.37/0.046) on student learning outcomes (SOUTCOME). This positive result indicated that Malay students (SMALAY) were more likely to perceive that the History teaching outcome had achieved its intended outcomes as stated in the curriculum.

SINDIAN effects on Students' Learning Outcomes

Similar results were evident for the Indian students (SINDIAN). This result show a positive direct effect (0.27/ 0.076) which revealed that Indian students were more likely to perceive that History teaching had accomplished its intended outcome as stated in the History curriculum.

CCP effects on Students Learning Outcomes

For students' preferred History classroom climate (CCP) the results revealed a positive effect (0.12/0.019) on students' learning outcomes. This indicates that the preferred History classroom climate had positive influence on the students' learning outcomes. Student who perceived a higher level of CCP in terms of personalised and participatory activities in the preferred History classroom perceived that History teaching had managed to achieve its learning outcomes as stated in the History curriculum.

ACHIEVING effects on Students' Learning Outcomes

Students who adopted achieving learning approaches had positive direct effects (0.34/ 0.059) on students' learning outcome. The analysis showed that students who adopted the achieving approach to learning were more likely to perceive that the History teacher had fulfilled the History learning objective as stated in the curriculum.

DEEP effects on Students' Learning Outcomes

Similar results were evident for students who employed deep approach to learning. Students who employed a deep approach (0.23/ 0.057) were more likely to perceive that History teachers had achieved the learning outcomes as stated in the History curriculum.

At level-2 the (teacher level), only one variable had positive directs effects on the students' learning outcomes; TCHINESE (β= 0.29). The result indicated that in a classroom with a higher proportion of Chinese students, students generally were more likely to perceive that History teachers had achieved their teaching goals as stated in the History curriculum.

Goodness-of-Fit, Variance Partitioning and Variance Explained

The proportions of variance explained by the final model at the students' and teachers' levels are presented in Table 9.11. The percentage of variance of scores at both levels were the maximum amounts of variance available at those levels that were subsequently explained in the HLM analyses. The results indicated that most of the variance (89%) was found between students' variables and only 11% occurred between teachers' variables. The final model explained (5%) of the variance available at the level 1 and (91%) of variance at teachers level. Overall the total amount of variance explained by the final model was 49%.

Table 9. 11 Estimation of Variance Component and Explained Variance for Student Learning Outcome

	Estimation of variance component between:	
	Students	Teachers
Number of cases	1653	52
Null Model	0.89	0.11
Final Two – level HLM Model	0.50	0.01
Variance at each level	0.90 / 0.12 + 0.89 = 89 %	0.11 / 0.11 + 0.89 = 11 %
Proposition of variance explained By final Two - Level Model	0.89 – 0.50 / 0.89 = 5 %	0.11 – 0.01 / 0.11 = 91 %
Overall variance explained	(0.89 – 0.50) + (0.11 – 0.01) / (0.89 + 0.11) = 49 %	

The final model's goodness-of-fit, presented in Tables 9.10 and 9.11, showed that, the deviance was reduced by 996.4, from 4580.16 in the null model to 3583.76 in the final model, with an additional 20 degrees of freedom.

9.7 Summary of the HLM findings

This chapter has presented the final two-level hierarchical linear models for the learning approaches models, surface, deep and achieving,as well as the learning outcomes,in relation to the students' and teachers' characteristics. Overall, four models were tested in the HLM analysis: (a) surface, (b) deep, (c) achieving, and (d) student learning outcomes. However, in this analysis there was no cross-level interaction or moderating effects on the direct effects of the variables used in this analysis. The findings are based on the direct effects that emerged from the two-level hierarchical linear models.

The null model was carried out as the beginning step of the HLM analysis to estimate the amount of variance available at the two levels. The same procedure was followed for each of the final models.

Since the HLM results did not show any cross-level interaction or moderating effects, the HLM findings only discussed the direct effects made evident between Level-1 and Level-2. The final model of surface approach to learning indicated that two of Level-1 variables, namely Chinese students (SCHINESE) and classroom climate preferred (CCP), and as well as one variable at Level-2: out-of-field/in-field History teachers (TINFIELD) influenced directly the students' adoption of the Surface learning approach.

The final model findings of the deep approach to learning indicated that three Level-1 variables e.g.: teachers' years of teaching (TYRRTEA), surface (SURFACE) and Achieving (ACHIEVING) approaches to learning, as well as four variables at Level-2, namely students' gender (SGDR), Chinese students (SCHINESE), classroom climate preferred (SCCP) and classroom climate actual (SCCA) directly influenced students' use of deep approach to learning.

The Achieving approach to learning final models revealed that two of the Level- 2 variables, SMALAY and SDEEP, and five Level-1 variables SGDR, SMALAY, SCHINESE, SCCP and SCCA, showed direct influences on students' adoption of the achieving approach to learning.

The final model of the studens' learning outcomes (SOUTCOME) indicated that one variable from Level-1, TCHINESE and five variables from Level-2: SMALAY, SINDIAN, SCCP, ACHIEVING, and SDEEP had direct effects on the SOUTCOME.

Overall, the HLM analyses revealed number of important findings:

1) The effects of the TINFIELD History teachers (y= -0.20) on surface learning approach. This finding indicated that students' in the clases of in-field History teachers were less likely to employ the surface approach in comparison to students in out-of-field History teaches' classes. The results showed that the Chinese students were less likely to adopt the surface approach (-0.41) to learning compared to non-Chinese students. Furthermore, the results revealed that SCCP had a positive effect (y= 0.13) on the surface learning approach, in that students in a History classroom which was close to their preferred climate were more likely to employ a surface approach to learning

2) The results on Deep Approach to learning at students' level showed that girls (y= 0.41) were more likely to adopt a Deep approach to learning in comparisons to boys. Compared to the results on the surface approach to learning, Chinese students (y = - 0.42) were less likely to adopt less a deep approach to learning compared to students of Malay, Indian and Others ethnicities. The findings in relation to preferred and actual classroom climates, SCCP (y = 0.25) and SCCA (y= 0.14). This indicated that the more the classroom climate was in line with what the students preferred and what they actually experienced, the more likely they were to use the deep approach to learning History in the classroom.

At the teacher level, the result revealed that TYRTEA (y = - 0.005), teachers who had more experience, were less likely to encourage a deep approach compared to novice History teachers. Furthermore, Surface approach to learning (y = -0.11) show a negative effect on the DEEP approach to learning. This suggested that the students in a classroom where on average more students used the surface approach to learning, were less likely to employ a Deep approach. In contrast, the positive effects of achieving (y= 0.38) shows that in a classroom that had a high proportion of students who used the achieving approach to learning, students generally were more likely to adopt Deep approach to learning in learning History classroom.

3) The finding on Achieving approach to learning showed the effect of student gender. The results indicated that girls (y= 0.19) were more likely to adopt an Achieving learning approach compared to boys. Malay students (β= 0.18) were also more likely adopt the Achieving learning approach in comparison to non-Malay students. On the other hand, the result for Chinese students (β = -0.32) indicated that they were less likely to employ Achieving approach to learning compared to students of Malay, Indian and Others ethnicities. Classroom climate, both SCCP (y = 0.26) and SCCA (y= 0.13), had positive influences on the Achieving approach to learning. This suggested that the more the classroom climate was in line with what the students preferred and what they actually experienced, the more they were likely to adopt the Achieving approach in learning History

At the teacher level, the results showed that SDEEP (y = 0.36) and SMALAY_M (0.23) had positive direct effects on the Achieving approach to learning. This showed that students in a classroom that had a high proportion of Malay students were more likely to adopt the Achieving approach to learning. Additionally, the results also indicated that in a classroom that had more students employing the Deep approach to learning (y =0.36), the more likely it was that students would use the Achieving approach to learning in the History classroom

4)The findings on Students' learning outcomes (SOUTCOME), showed positive effects for Malay students (β = 0.38) and Indian students (β= 0.27). These figures indicated that Malay students (SMALAY) and Indian students (SINDIAN) were more likely to perceive that the History teacher had accomplished the intended learning outcomes as stated in the History curriculum in comparison to students of other ethnicities. Similar results were found for students who adopted Achieving approach to learning (y = 0.34). They perceived that the History teacher had achieved the outcome in teaching History in comparison to those students with a DEEP (y = 0.23) learning approach. For the preferred History classroom climate (SCCP), the results showed that SCCP had a low positive (y = 0.12) direct effect on the SOUTCOME. This positive effect indicated that student who perceived a higher level of SCCP were more likely to perceive that History teachers had accomplished the History learning objectives as stated in the History curriculum. At the teachers' level, the results showed that TCHINESE had positive effect (β= 0.29) on students learning outcomes. This indicated that in a classroom that had higher proportion of Chinese students, students generally were more likely to perceive that the History teachers had achieved the History learning outcomes.

In conclusion, although there were no cross-level interactions or moderating effects found in the models discussed, the two-level HLM analysis used in this study provided general support for student learning approaches, namely surface, deep and achieving. The findings revealed that those variables did effect the students' learning outcomes. Moreover, HLM analyses findings indicated the direct influence of the variables discussed at both student and teacher levels in a way that confirmed and strengthened the findings in the previous chapters. These HLM results provided some evidence concerning the comparative effects of out-of-field and in-field teachers on secondary History classrooms in Malaysia.

Probably, the most important finding to emerge from the HLM analysis was the comparatively small effects reported for the level 2 variables, Teacher qualifications in History (whether out-of-field or in-field) and Teacher Experience, (which was closely linked to qualifications) did not emerge as important factors in the learning outcomes of Malaysian History classrooms. The in-field qualification did occur once as a negative effect on students' adoption of surface approaches to learning, while Teachers' Experience had a small negative effect on students' adoption of deep approaches to learning. The implications of these findings are considered in the concluding chapter that follows.

Chapter 10 Discussion and Conclusions

10.1 Introduction

The final chapter discusses the findings of this investigation into the phenomenon of out-of-field History Teaching in Malaysian secondary schools. It begins by summarizing the aims and design of the study and reporting the findings which directly answered the original research questions. Subsequent sections consider the implications of the findings for secondary History classrooms in Malaysia, the need for a replication of the investigation and recommendations for future research.

10.2 Design of the study

The study set out to investigate the impact of out-of-field History teachers on the teaching and learning processes in Form Four secondary school History classrooms in Malaysia. Although the phenomenon of out-of-field teaching can be found in many countries, this present research focussed on three broad questions related to History teaching in Malaysian secondary schools. As outlined in Chapter 1, these were:

(a) Are there any differences between out-of-field and in-field History teachers?

(b) What are the impacts of teacher qualifications (in-field and out-of-field) on the History teaching and learning process at the classroom and student level?

(c) How do the teacher qualifications (in-field and out-of-field) interact with other factors in influencing the teaching and learning process in the History classroom?

In the course of reviewing previous research in the area of in-field and out-of-field teachers in the classroom learning, a number of teacher and student factors, which could influence the learning process in the History classroom were identified and a theoretical framework, based on Biggs's 3P Model of students' learning, was developed. To gather data related to the variables identified in this framework, the researcher prepared a set of teachers' questionnaires which incorporated three scales. These were the Teachers' Conceptions of Teaching by Gao & Watkins (2002), the Approaches to Teaching Instruments (ATI) by Trigwell, Prosser and Ginns (2005), and a History Teaching Method questionnaire which was developed by the researcher. Similarly, there was a set of students' questionnaires, incorporating three scales: the Individualised Classroom Environment Questionnaire (ICEQ) by Fraser (1990), the Biggs's Learning Process Questionnaire (LPQ) by Biggs (1987), and a questionnaire on Students' Perceptions of History Learning developed by the researcher. A total of 52 Form Four History teachers from Kuala Lumpur secondary schools completed the teacher questionnaires and 1653 students, taught by these teachers, completed the students' questionnaires.

In the analysis of the data, the Confirmatory Factor Analysis was used to check the validity and consistency of the questionnaires. The validity of the teacher and student questionnaires were discussed in Chapters 4 and 5 respectively. In order to examine the relationships between the latent and manifest variables in the measurement models and between the latent variables in the structural model, the partial least square (PLS) path analysis technique was employed (see Chapters 7 & 8). Since this study involved two levels of data, teacher and student, Hierarchical Linear Modelling (HLM) was employed to examine effects at the two levels, as well as the interaction between the effects at these levels (see Chapter 9).

10.3 Summary of the findings

This section presents the findings of the study based on the research questions advanced in Chapter 1. Research question 1 was answered on the basis of the t-test analyses reported in Chapter 6, whilst the answers to research questions 2 and 3 were based on the PLS and HLM analyses in Chapters 7, 8 and 9.

Research Question 1

Are there any differences between out-of-field and in-field History teachers?

The t-test analysis (see Chapter 6) was used to examine the differences between out-of-field teachers and in-field teachers. On most of the variables tested, there were no statistically significant differences between in-field and out-of-field History teachers in Malaysia. The only four variables in which the differences proved significant were teacher experience, the teaching conception of conduct guidance, the dimensions of personalization, participation, independent and differentiation (see Chapter 4) in the students' preferred classroom climate, and the dimension of personalisation in the students' actual classroom environment.

In relation to teacher experience (measured in years of teaching) the results indicated that out-of-field History teachers were less experienced compared to the in-field teachers. Out-of-field History teachers had, an average of 7 years of service, compared to 14 years for in-field teachers. The finding would seem to be the consistent with the school context in Malaysia. As student numbers have increased, and schools have needed more History teachers, there has been a tendency to make use of less experienced members of staff as out-of-field history teachers. Staff members with more experience are more likely to be teaching in the area of their training specialisation, in this case upper level History.

Of the five dimensions of teachers’ teaching conceptions employed, only the conduct guidance conception, which previous studies had identified as an important aim of teaching (e.g. Goa & Watkins, 2001; Pratt 1992; Fox 1983), showed a significant difference between in-field and out-of-field teachers. This result indicated that in-field teachers, whom the previous results had shown to be the more experienced teachers, were more likely to be committed to nurturing the personal conduct of their students through their History teaching.

In terms of preferred classroom climate, there was a significant difference between students of in-field teachers and those of out-of-field teachers on four out of the five dimensions. This means that students under in-field teachers preferred classrooms where they experienced investigation, personalisation, participation, and differentiation. On the fifth dimension of independence there was no difference between the two groups of students, suggesting that the authority of the teacher in the classroom was recognised, whether they were fully qualified or not.

In the actual students’ classroom climate, out of the five dimensions used for this factor, only personalisation showed any significant difference between students under the two groups of teachers, with students of in-field teachers experiencing greater personalisation. This result can be explained by the greater experience of in-field teachers in the Malaysian context. In particular, they are more likely to have been teaching longer in the same school and even to have taught the same class for two or more years. They thus have had a greater opportunity to gain personal understanding of the students they are teaching.

It is possible, that out-of-field teachers, who are younger and less experienced, may be able to develop a more personalised dimension to their classrooms, as they gain more familiarity with the History syllabus and get to know the students in their classes better. An out-of-field teacher whose efforts are concentrated on subject content which is new to them, has less time to focus on understanding students' needs and interests. The chance for professional development in the teaching of History may help them to become more familiar with the content and assessment requirements, so that they are able to direct more of their attention to the individual students in their class.

There were four variables which showed no significant difference on the t-test results in this study, namely; teachers' teaching approach, teaching methods, students' approaches to learning, and learning outcomes. This is an important finding in that it indicates not only that in-field and out-of-field teachers were using much the same teaching approaches and methods, but also that the students under each group of teachers were adopting similar approaches to learning and perceiving much the same learning outcomes in their History classroom. These results can be seen to be consistent with expectations that teachers in Malaysia follow the set of objectives and lesson plans laid out in the History syllabus. In addition, out-of-field teachers are fully trained in another area of specialization and thus can be expected to adopt their knowledge and teaching skills to the teaching of History.

Research Question 2

What are the impacts of teachers' qualifications (in-field and out-of-field) on the History teaching and learning process at the classroom and student level?

PLS and HLM were used to address this research question which was related to the aim of investigating how History teachers' qualifications (whether in-field or out-of-field) impacted directly on other factors to influence the learning outcomes in the History classroom. For the teacher and student samples, the PLS (single-level) path analysis indicated that there were five variables that showed direct (either positive or negative) relationships with teachers' qualifications (in-field or out-of-field).

One of these variables was teacher age. The results showed that the teachers' age was strongly associated with their type of qualification, with older teachers being, in general, more qualified in History than their younger counterparts. In addition to being better qualified to teach History, these older teachers were, as could be expected, also more experienced in teaching the subject.

In relation to Classroom Climate Preferred students of in-field History teachers were more likely to prefer a classroom environment which was personalized, participatory and focused on investigating. For the Classroom Climate Actual, students of in-field History teachers (who were more likely to be older teachers) tended to experience their actual classroom climate as independent, participatory, and differentiated.

An indirect relationship was also found between in-field teachers and student learning outcomes through the teacher experience factor. Students taught by experienced History teachers (mainly in-field teachers) were more likely to show a higher level of appreciation of the History syllabus objectives and the way learning History fostered their learning of moral values. They also showed more appreciation of their increased maturity and ability to think individually and the efforts and the contributions of individuals who have struggled for the independence and development of the country, and for the community in general. This result is consistent with expectations that in-field teachers would have greater understanding of the History syllabus and its objectives than out-of-field teachers, partly because of their training and partly because of their greater overall experience of teaching History.

The results of the PLSPATH analyses showed that teacher qualifications (out-of-field and in-field) had no direct relationship either to student learning approaches or to student History learning outcomes. This is consistent with the t-test results which showed no difference in teaching methods and approaches in the classroom between out-of-field and in-field History teachers. The overall implication is that there was no difference between out-of-field and in-field teachers in their impact on their students' learning approaches and History learning outcomes in Malaysian classrooms.

Research Question 3

How do the teacher qualifications (in-field and out-of-field) interact with other factors in influencing the teaching and learning process in the History classroom?

Path model analysis and Hierarchical Linear Modeling were used to examine the inter-relationships between teachers' qualifications (in-field and out-of-field) and other teaching and learning factors at both classroom and student levels. It had been argued that variables such as teachers' teaching conceptions, approaches, and methods would be expected to influence the climate of the classroom which in turn would have some impact on students' approaches to learning in the History classroom.

The results indicated that older History teachers were more likely to adopt effective and active teaching methods in the classroom. Moreover, they were also more likely to have a higher level of conceptions of teaching in the History classroom. In turn, the teaching methods they employed influenced the actual classroom climate.

In terms of student approaches to learning, the variable of teachers' qualifications was found to have no direct effect on any of the three student approaches to learning (Surface, Achieving and Deep). However, out-of-field teacher qualifications had a small indirect, but negative effect on the Achieving learning approach through classroom climate actual.

In relation to the Deep approach to learning, four variables at the student level namely, student gender, Chinese student ethnicity, classroom climate preferred, and classroom climate actual were found to have significant effects. This indicates that Chinese, Indian, and those of other ethnic background in the actual classroom environment were more likely to adopt DEEP learning approaches compared to Malay students. In addition, students in classrooms where, on average, the students' use of the Surface approach to learning was high, were less likely to adopt a Deep approach. In contrast, students in classrooms where, on average, students employed an Achieving approach to learning, were more likely to adopt a Deep approach.

At the teacher level, there were three factors which influenced students' DEEP learning approach, namely, teacher experience, Surface Learning Approach and Achieving

Learning Approach. The first two factors showed a direct negative effect on students' Deep approach to learning, indicating that teachers who had more experience were less likely to encourage students to adopt the Deep Learning Approach compared to out-of-field History teachers. In addition, students in classes under in-field teachers, where students on average were using the Achieving approach to learning, presumably to maximize examination results, students were more likely to adopt the Deep approach to learning in the classroom.

However, the Hierarchical Linear Modeling analysis showed that teachers' qualifications (whether out-of-field/in-field) had comparatively small effects on students' History leaning outcomes. This was consistent with the findings for the two previous research questions which indicated that there was little or no difference between out-of-field and in-filed teachers in the learning experiences of students in the secondary Malaysian History classroom.

10.4 Implications of the study

The findings from the present study have important implications in relation to the teaching and learning in History classrooms in Kuala Lumpur, Malaysia. These can make a contribution to better understanding of theoretical and methodology issues, as well as having implications for policy and practice in education in Malaysia. These implications are discussed below.

Theoretical Implications

In general, the findings have developed our knowledge on the issue of out-of-field teaching in the learning process, in particular for History teaching. Much literature had focussed on the macro impact of out-of-field teachers in teaching at the school or state level. What remained unclear was how teachers with out-of-field qualifications actually taught in the classroom, and whether there were any differences in students' learning between classes taught by out-of-field and in-field History teachers. This study has improved our understanding by pinpointing the importance of teachers' experience, conduct guidance as a conception of History teaching, personalization in the classroom climate and students' History learning outcomes, as defined by the syllabus objectives. In relation to all the above variables, there were differences between in-field and out-of-field teachers.

The phenomenon of out-of-field teaching is still prevalent in education and has stimulated many researchers to investigate this issue. However, this is the first study in the field conducted in Malaysia. Although there are differences between schools in the various states and rural regions which may affect the application of these Kuala Lumpur findings to other parts of Malaysia, some useful implications can be drawn for the teaching of History generally at secondary level in Malaysia. In addition, the findings can be used as a basis for future research in other contexts.

Furthermore, this study has provided empirically based analytical procedures for testing and extending existing frameworks and models of the relationships between the many variables which can impact on and interact with classroom learning and teaching in general. Two statistical techniques were employed in this study namely, Path analysis for single – level data (see Chapter 7 and 8) and HLM for multilevel data (see Chapter 9) to test the models representing the way out-of-field qualifications impacted on, and interacted with, the other variables in the present study. Overall, these findings provide a better understanding of the relationships between out-of-field qualifications and other teacher and student factors, in the process of learning History in Malaysian classrooms.

Methodological Implication

This section reviews the main statistical methods used in this study and considers how effective they were in dealing with issues raised by the nature of the data. To deal with the missing information which occurred in the questionnaire, Multiple Imputation (MI) was used. It was important to be aware of, and take steps to minimize the potential limitations of this method, such as the introduction of bias through loss of information, distortion in estimating the parameters of the model through variations in sample size for each variable and possible inflation of correlations (Schafer, 1997; Patrician, 2002). Nevertheless, the simplicity and comparability of the Multiple Imputation (MI) method proved to have real advantages.

The other issue that required careful choice of statistical methods related to the fact that data were gathered not only from teachers, at the higher organizational level, but also from students at the individual level. Information related to the teacher variables, such as teachers' characteristics, teachers' conceptions and teaching methods could not be combined with students' data on approaches of learning, classroom climates, or perceived learning outcomes, into a single level of analysis without causing possible bias and distortion. Partial Least Square path analysis (PLSPATH) was therefore used to carry out a two-step procedure of first aggregating the lower level students' data to the higher teachers' level data, and secondly disaggregating the higher level data to lower level student data. To counteract the problem of bias in this single level analysis, Hierarchical Linear Modeling (HLM) was employed as a methodological procedure to examine the nested structure data. The combination of these two statistical methods proved effective in pinpointing a number of worthwhile relationships.

Policy and Practice Implication

Many of the previous studies of out-of-field teaching have been critical of employing teachers without a strong background in the subjects they are teaching (McConney et al., 2009). The results of this study provide some justification for the steps taken by Malaysian government to employ out-of-field teachers in secondary schools in Malaysia, while pointing to ways in which the classroom performance of these teachers could be improved. In particular, employing out-of-field History teachers can be regarded as the most practical and sensible policy to ensure that every History classroom has a teacher. It is a policy which can be continued, provided the issues surrounding out-of-field teachers discussed above are properly understood and appropriately handled.

The findings of this study point to a number of suggestions, at both the policy and practice level, which could support out-of-field teachers and minimize any negative impact of their lack of History qualifications on students' classroom learning. Based on the results in this study, the researcher would suggest that out-of-field teachers should be given the opportunity to attend short courses to enhance their knowledge of syllabus objectives, content and assessment. The creation of alliances or networks between in-field and out-of-field teachers in the same or neighbouring schools would also be valuable. This would make use of the finding that in-field teachers were generally older and more experienced, and hence in a position to mentor their out-of-field colleagues who have had less experience in teaching History. In this way, this study supports the recommendations made by Ingersoll (2003) that professional development, and mentoring support should be provided for out-of-field teachers.

10.5 Limitations of the study and recommendations for future research

One of the limitations of this present study is related to the data collection process. Not many schools were willing to participate in the study, partly because the teachers were busy preparing for the midyear school examination, the reason given by many schools for not participating. Then, during the conduct of the research there were constant rearrangements of meetings with principals, teachers and students, which further delayed the process of data collection. Further the collection of questionnaire responses from schools around the city proved very time consuming.

Another restriction was that the researcher was not able to obtain samples of students from Form Five (year 12), because they were involved with the public examinations at the time. As a result the study was not able to compare the out-of-field and in-field History teachers on the basis of their students' performance in this examination.

Over and above the inconveniences of data collection, the more serious limitation related to the samples used in this research. Data were collected only from secondary schools in Kuala Lumpur. The results therefore cannot be generalised to the whole secondary school population in Malaysia. It should also be pointed out that results of this study of History teachers in Kuala Lumpur cannot be generalized either to other subject teachers in Malaysia or to History teachers in other countries. Nevertheless, the findings can be useful as a guide for future research to better understand the current deployment of in-field and out-of-field History teachers in Malaysian secondary schools and its impact on students' experiences of learning History.

The limitations point to a number of areas for future research. A similar investigation with a larger number of teacher respondents (and hence students) would be most valuable to check the findings of the present study. There are two other ways the sample base could be usefully extended in Malaysia. The first involves including a range of private schools and the second, the inclusion of government schools from rural areas and regional centres in Malaysia. Such a widely sourced sample would enable differences among ethnic, cultural, and socio-economic groups in Malaysia to be taken into account. The inclusion of students from Form Five (Year 12) level in such future research would enhance the understanding of student outcomes by adding cognitive measures related to examination results to the affective measures used in the present study. It would also be very useful to have comparable studies of History classrooms conducted in other countries, both those of established nations and those which have emerged from colonial control in the last half century.

10.6 Conclusion

This study aimed to investigate the differences between in-field and out-of -field History teachers in Malaysia in relation to students' learning outcomes, defined in terms of their understanding and appreciation of the objectives of the History syllabus they were studying. Through the statistical techniques employed to analyse data collected from 52 Form Four History teachers in Kuala Lumpur and 1653 students whom they taught, the study has provided a mixed set of results.

On the one hand, no statistically significant differences emerged between in-field and out-of -field teachers on a number of key variables, such as approaches to teaching, methods of teaching and students' approaches to learning. These results could be explained largely in terms of the context of teaching History in Malaysia, where teachers are required to follow a set text, a syllabus outline of weekly topics to be covered and a national system of assessment by examination. On the other hand, there were a number of other variables where the statistical analysis revealed differences between in-field and out-of-field teachers. These included the teacher characteristic of experience, the dimensions of classroom climate, both preferred and actual, especially in relation to the personalisation of teaching in response to students' needs and interests and, most importantly, students' learning outcomes. Implementing the recommendations made in this chapter could enhance the performance of out-of-field teachers in these areas and improve the overall quality of History teaching in Malaysian secondary classrooms.

THE UNIVERSITY OF ADELAIDE AUSTRALIA

SUB CRUCE LUMEN

Appendix 1- Teachers Questionnaire

SCHOOL OF EDUCATION

TEACHING OF HISTORY

TEACHERS' QUESTIONNAIRE

A project by:

Umi Kalsum Mohd Salleh

School of Education
University of Adelaide

Supervised by:

Teachers' Teaching of History QUESTIONNAIRE

In this booklet you will find:

- *General Information* items
- Items about *Teachers' Conceptions of Teaching*
- Items about *Teachers' Approaches to Teaching*
- Items about *History Teaching Methods*

Please read each question carefully and answer as accurately as you can. For this questionnaire, you will answer in several ways – by <ticking> a box, marking a box with an "X", or writing down a number that corresponds to your answer for a particular question/item. For a few questions you will need to write a short answer.

If you make a mistake in your answer, simply cross out (or shade the whole box) your error and mark the correct answer. If you make an error when writing an answer, simply cross it out and write your answer next to it.

In this questionnaire, there are no "right" or "wrong" answers. Your answers should be the ones that you think are "right" for you.

You may ask for help if you do not understand something or are not sure how to answer a question. General information about your school will be provided for you to be able to answer some of the items that pertain to your school.

Your answers will be combined with others to make totals and averages in which no individual can be identified. <u>All your answers and your identity will be kept strictly confidential</u>.

Your cooperation is greatly appreciated.

Thank you

Teacher Name:

School Name:

Please proceed to the next page

Section 1: GENERAL INFORMATION

<u>Yourself</u>

For each item, please mark the box that corresponds to your answer with an "**X**".

1. Gender: ☐ Male
   ☐ Female

2. Age: ☐ years

3. Race: ☐ Malay
   ☐ Chinese
   ☐ Indian
   ☐ Other ________________

4. Qualification level:

☐ MA in ______________________________
Major: ______________________________
Minor: ______________________________

☐ BA in ______________________________
Major: ______________________________
Minor: ______________________________

☐ Diploma in __________________________
Major: ______________________________
Minor: ______________________________

☐ Certificate in ________________________
Major: ______________________________
Minor: ______________________________

☐ Others ________________________________

. 5. How many years of teaching ______________

Please proceed to the next page

Section 2: TEACHERS' CONCEPTIONS OF TEACHING

Please mark the box that corresponds to your answer with an "**X**".

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
6.	Students learning means accepting knowledge from the teachers.	☐	☐	☐	☐	☐
7.	Most of the teacher training workshops which I attended focus on strategies of promoting students' motivation.	☐	☐	☐	☐	☐
8.	I never miss any chance to demonstrate how to be a nice person.	☐	☐	☐	☐	☐
9.	Usually I will publish the results of student performance in tests.	☐	☐	☐	☐	☐
10.	I like those students who know the knowledge learnt accurately.	☐	☐	☐	☐	☐
11.	Interaction with the outside world is the most important way of students learning.	☐	☐	☐	☐	☐
12.	I am very interested in sharing experiences with my colleagues on improving student behaviour through teaching.	☐	☐	☐	☐	☐
13.	I should spend most of my time in drilling students with exam-type items.	☐	☐	☐	☐	☐
14.	I would be very satisfied if my students could remember the details knowledge imparted in the History textbooks.	☐	☐	☐	☐	☐
15.	Students learning means knowing how to mature gradually.	☐	☐	☐	☐	☐

16. I like to exchange information and share experiences on the exam with my colleague in meetings and in-service activities. ☐ ☐ ☐ ☐ ☐

17. Delivering knowledge is the essence of teaching. ☐ ☐ ☐ ☐ ☐

18. The most important reason for students going to school is to gain qualifications necessary for future studies or career. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
19.	Preparing a large amount of teaching materials is the most important factor for successful classroom teaching.	☐	☐	☐	☐	☐
20.	I expect my students to become more and more interested in learning through my history subject.	☐	☐	☐	☐	☐
21.	I prefer those students who are competitive and get good marks in exams.	☐	☐	☐	☐	☐
22.	I strongly agree with the simile that views a teacher as a bank of knowledge.	☐	☐	☐	☐	☐
23.	Organizing activities to change students' misconceptions is the key of good teaching.	☐	☐	☐	☐	☐
24.	Teaching means to develop students' behaviour.	☐	☐	☐	☐	☐
25.	My greatest concern is that all my students will get excellent marks in exam.	☐	☐	☐	☐	☐
26.	Proficiency in history is of prime importance to a history teacher.	☐	☐	☐	☐	☐
27.	I often challenge students with questions focusing on their perceptions before I start a new topic.	☐	☐	☐	☐	☐
28.	For a successful lesson, it is very important to make the students concentrate on their learning.	☐	☐	☐	☐	☐

29. Knowing the teaching content thoroughly is the most important task in preparing a lesson. ☐ ☐ ☐ ☐ ☐

30. A history teacher should understand the fundamentals of students' attitudes. ☐ ☐ ☐ ☐ ☐

31. A teacher should act as a model of learning to students by being diligent in learning and teaching. ☐ ☐ ☐ ☐ ☐

32. Drilling students with well-designed exercises is key to a successful lesson. ☐ ☐ ☐ ☐ ☐

33. The theme of my preparation for a lesson is how to organize student activities. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
34.	To be able to promote correct learning attitudes in students is a very important prerequisite for a teacher.	☐	☐	☐	☐	☐
35.	A teacher should win the students' respect through his/her attitude to studying.	☐	☐	☐	☐	☐
36.	I would be better not organizing classroom activities so they can spend most of the time for a better interpretation of knowledge.	☐	☐	☐	☐	☐
37.	The role of a history teacher is similar to a tourist guide who leads students in the way of learning.	☐	☐	☐	☐	☐
38.	I pay much of my attention on how to educate students with good conduct when preparing a lesson.	☐	☐	☐	☐	☐
39.	Teachers should know clearly about the objectives of their schools and the examination.	☐	☐	☐	☐	☐
40.	I try hard to create chances for students to ask questions during class.	☐	☐	☐	☐	☐
41.	I never miss any chances to encourage my students to learn actively.	☐	☐	☐	☐	☐
42.	I concentrate on how to ensure that students follow my teaching while preparing my lessons.	☐	☐	☐	☐	☐

Section 3: APPROACHES TO TEACHING

Please <u>mark the box</u> that corresponds to your answer <u>with an "**X**"</u>.

	Only Rarely (1)	Sometimes (2)	About Half The Time (3)	Frequently (4)	Almost Always (5)
43. In this subject students should focus on what I provide them.	☐	☐	☐	☐	☐
44. It is important that this subject should be completely described in terms of specific objectives that relate to formal assessment items.	☐	☐	☐	☐	☐
45. In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying.	☐	☐	☐	☐	☐
46. It is important to present a lot of facts to students so that they know what they have to learn for this subject.	☐	☐	☐	☐	☐
47. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	☐	☐	☐	☐	☐
48. In this subject I concentrate on covering the information that might be available from key texts and readings.	☐	☐	☐	☐	☐
49. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop	☐	☐	☐	☐	☐

50. In teaching sessions in this subject, I use difficult or undefined examples to provoke debate. ☐ ☐ ☐ ☐ ☐

51. I structure my teaching in this subject to help students to pass the formal assessment items. ☐ ☐ ☐ ☐ ☐

52. I think an important reason for running teaching sessions in this subject is to give students a good set of notes. ☐ ☐ ☐ ☐ ☐

53. In this subject, I provided the students with the information they will need to pass the formal assessments. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

		Only Rarely (1)	Sometimes (2)	About Half The Time (3)	Frequently (4)	Almost Always (5)
54.	I should know the answers to any questions that students may put to me during this subject.	☐	☐	☐	☐	☐
55.	I make available opportunities for students in this subject to discuss their changing understanding of the subject.	☐	☐	☐	☐	☐
56.	It is better for students in this subject to generate their own notes rather than always copy mine.	☐	☐	☐	☐	☐
57.	I feel a lot of teaching time in this subject should be used to question students' ideas.	☐	☐	☐	☐	☐
58.	In this subjects my teaching focuses on the good presentation of information to students.	☐	☐	☐	☐	☐
59.	I see teaching as helping students develop new ways of thinking in this subject.	☐	☐	☐	☐	☐
60.	In teaching this subject it is important for me to monitor students' changed understanding of the subject matter.	☐	☐	☐	☐	☐
61.	My teaching in this subject focuses on delivering what I know to students.	☐	☐	☐	☐	☐
62.	Teaching in this subject should help students question their own understanding of the subjects matter.	☐	☐	☐	☐	☐

63. Teaching in this subject should help students find their own learning resources. ☐ ☐ ☐ ☐ ☐

64. I present material to enable students to build up an information base in this subject. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

Section 4: HISTORY TEACHING METHOD
Please mark the box that corresponds to your answer with an "**X**".

In teaching History in your classroom how often do you do the following activities?

		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
65.	Role play/ Drama	☐	☐	☐	☐	☐
66.	Classroom Discussion	☐	☐	☐	☐	☐
67.	Debate	☐	☐	☐	☐	☐
68.	Student Presentation	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐
69.	Group work	☐	☐	☐	☐	☐
70.	Project work	☐	☐	☐	☐	☐
71.	Field Trips	☐	☐	☐	☐	☐
72.	I know how to select and structure historical knowledge for instructional purposes.	☐	☐	☐	☐	☐
73.	I know how to use a wide range of strategies and approaches for representing history	☐	☐	☐	☐	☐
74.	I know how to use historical knowledge to foster critical thinking.	☐	☐	☐	☐	☐
75.	I teach history as possible interpretations of the past rather than as fact.	☐	☐	☐	☐	☐
76.	During a history lesson I involve students in working with raw materials (newspaper, photographs, political cartoon, letters, etc)	☐	☐	☐	☐	☐
77.	I require students to connect and relate various pieces of evidence to build images of the past	☐	☐	☐	☐	☐
78.	I provide students with opportunities to practise critical thinking skills likes (eg; document based questioning).	☐	☐	☐	☐	☐
79.	I teach students to analyse primary and secondary source documents during history class.	☐	☐	☐	☐	☐

Please proceed to the next page

		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
80.	I encourage students to use tools of inquiry such as interrogation, analysis, and interpretation.	☐	☐	☐	☐	☐
81.	I Introduce students to investigative processes and skills of handling, reading, and evaluating evidence.	☐	☐	☐	☐	☐
82.	I am aware that learning history is a social activity through which students learn from each other.	☐	☐	☐	☐	☐
83.	I recognise that gradually building the context for history inquiry is essential for learning.	☐	☐	☐	☐	☐

THIS IS THE END OF THE QUESTIONNAIRE

Thank You

for completing this questionnaire

Appendix 2- Students Questionnaire

THE UNIVERSITY OF ADELAIDE AUSTRALIA

SCHOOL OF EDUCATION

LEARNING IN HISTORY

STUDENTS' QUESTIONNAIRE

A project by:

Umi Kalsum Mohd Salleh

School of Education
University of Adelaide

Supervised by:

Students' Learning in History QUESTIONNAIRE

In this booklet you will find:

- *General Information* items
- Items about *Classroom Climate*
- Items about *Approaches to Learning*
- Items about *Students' Perceptions of History*

Please read each question carefully and answer as accurately as you can. For this questionnaire, you will answer in several ways – by <ticking> a box, marking a box with an "X", or writing down a number that corresponds to your answer for a particular question/item. For a few questions you will need to write a short answer.

If you make a mistake in your answer, simply cross out (or shade the whole box) your error and mark the correct answer. If you make an error when writing an answer, simply cross it out and write your answer next to it.

In this questionnaire, there are no "right" or "wrong" answers. Your answers should be the ones that you think are "right" for you.

You may ask for help if you do not understand something or are not sure how to answer a question. General information about your school will be provided for you to be able to answer some of the items that pertain to your school.

Your answers will be combined with others to make totals and averages in which no individual can be identified. <u>All your answers and your identity will be kept strictly confidential</u>.

Your cooperation is greatly appreciated.

Thank you.

Student Name:

School Name:

Form Four:

☐ Science

☐ Arts

Please proceed to the next page

Section 1: General information

Yourself

For each item, please mark the box that corresponds to your answer with an "**X**".

1. Gender: ☐ Male ☐ Female

2. Age: ☐ years

3. Race: ☐ Malay ☐ Chinese ☐ Indian ☐ Other ____________

4. Mother's highest educational level: ☐ No formal education ☐ Primary education ☐ Secondary education ☐ Diploma ☐ Degrees ☐ Post graduate

5. Your mother's occupation: ______________________________

6. Father's highest educational level: ☐ No formal education ☐ Primary education ☐ Secondary education ☐ Diploma ☐ Degrees ☐ Post Graduate

7. Your father's occupation: ______________________________

Please proceed to the next page

Section 2: <u>YOUR CLASSROOM CLIMATE</u>

2.1 What actually happens in your history classroom

This questionnaire contains statements about things which could happen in this classroom. You will be asked **how often** each practice **actually happens**.

There are no 'right' or 'wrong' answers. Your **opinion** is what is wanted.

Think about how well each statement describes what your actual classroom is like. For each of the following items, please mark the box that corresponds to your answer with an "**X**".

1 – if the practice *actually happens* **never**
2 – if the practice *actually happens* **seldom**
3 – if the practice *actually happens* **sometimes**
4 – if the practice *actually happens* **often**
5 – if the practice *actually happens* **very often**

REMEMBER: You are rating what ***actually happens*** in your history classroom.
"*In our history lessons…*"

		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
8.	The teacher talks with each student.	☐	☐	☐	☐	☐
9.	Students give their opinions during discussions.	☐	☐	☐	☐	☐
10.	The teacher decides where students sit.	☐	☐	☐	☐	☐
11.	Students find out the answers to questions from textbooks rather than from history inquiry.	☐	☐	☐	☐	☐
12.	Different students do different work.	☐	☐	☐	☐	☐
13.	The teacher takes a personal interest in each student.	☐	☐	☐	☐	☐
14.	The teacher lectures without students asking or answering questions.	☐	☐	☐	☐	☐
15.	Students choose their partners for group work.	☐	☐	☐	☐	☐

16.	Students carry out history inquiry to check evidence.	☐	☐	☐	☐	☐
17.	All students in the class do the same work at the same time.	☐	☐	☐	☐	☐
18.	The teacher is unfriendly to students.	☐	☐	☐	☐	☐
19.	Students' ideas and suggestions are used during classroom discussion.	☐	☐	☐	☐	☐
20.	Students are told how to behave in the classroom.	☐	☐	☐	☐	☐

Please proceed to the next page

	Item	Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
21.	Students carry out history inquiry to answer questions coming from class discussions.	☐	☐	☐	☐	☐
22.	Different students use different books and materials.	☐	☐	☐	☐	☐
23.	The teacher helps each student who is having trouble with the work.	☐	☐	☐	☐	☐
24.	Students ask the teacher questions.	☐	☐	☐	☐	☐
25.	The teacher decides which students should work together.	☐	☐	☐	☐	☐
26.	Students explain the meanings of statements and time line.	☐	☐	☐	☐	☐
27.	Students who work faster than others move on to the next topic.	☐	☐	☐	☐	☐
28.	The teacher considers students' feelings.	☐	☐	☐	☐	☐
29.	There is classroom discussion.	☐	☐	☐	☐	☐
30.	The teacher decides how much movement and talk there should be in the classroom.	☐	☐	☐	☐	☐
31.	Students carry out history inquiry to answer questions which puzzle them.	☐	☐	☐	☐	☐
32.	The same teaching aid (e.g. blackboard or overhead projector) is used for all students in the class.	☐	☐	☐	☐	☐

Please proceed to the next page

2.2 Your preferred History classroom.

This questionnaire contains statements about things which could happen in this classroom. You will be asked **how often** you would **like** or **prefer** each practice to happen.

There are no 'right' or 'wrong' answers. Your **opinion** is what is wanted.

Think about how well each statement describes how you would really like your classroom to be. For each of the following items, please mark the box that corresponds to your answer with an "**X**".

1 – if you'd *prefer* the practice to happen **never**
2 – if you'd *prefer* the practice to happen **seldom**
3 – if you'd *prefer* the practice to happen **sometimes**
4 – if you'd *prefer* the practice to happen **often**
5 – if you'd *prefer* the practice to happen **very often**

REMEMBER: You are rating what ***you would like*** to happen in your history classroom.
"*In my ideal history lessons, I would like…*"

		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
33.	The teacher would talk to each student.	☐	☐	☐	☐	☐
34.	Students would give their opinions during discussions.	☐	☐	☐	☐	☐
35.	The teacher would decide where students sat.	☐	☐	☐	☐	☐
36.	Students would find out the answers to questions from textbooks rather than from history inquiry.	☐	☐	☐	☐	☐
37.	Different students would do different work.	☐	☐	☐	☐	☐
38.	The teacher would take personal interest in each student.	☐	☐	☐	☐	☐
39.	The teacher would lecture without students asking or answering questions.	☐	☐	☐	☐	☐
40.	Students would choose their partners for group work.	☐	☐	☐	☐	☐

41. Students would carry out history inquiry to check evidence.	☐	☐	☐	☐	☐
42. All students in the class would do the same work at the same time.	☐	☐	☐	☐	☐
43. The teacher would be unfriendly to students.	☐	☐	☐	☐	☐
44. Students' ideas and suggestions would be used during classroom discussion.	☐	☐	☐	☐	☐
45. Students would be told how to behave in the classroom.	☐	☐	☐	☐	☐

Please proceed to the next page

		Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Very often (5)
46.	Students would carry out history inquiry to answer questions coming from class discussions.	☐	☐	☐	☐	☐
47.	Different students would use different books and materials.	☐	☐	☐	☐	☐
48.	The teacher would help each student who was having trouble with the work.	☐	☐	☐	☐	☐
49.	Students would ask the teacher questions.	☐	☐	☐	☐	☐
50.	The teacher would decide which students should work together.	☐	☐	☐	☐	☐
51.	Students would explain the meanings of statements, diagrams and graphs.	☐	☐	☐	☐	☐
52.	Students who worked faster than others would move on to the next topic.	☐	☐	☐	☐	☐
53.	The teacher would consider students' feelings.	☐	☐	☐	☐	☐
54.	There would be classroom discussion.	☐	☐	☐	☐	☐
55.	The teacher would decide how much movement and talk there should be in the classroom.	☐	☐	☐	☐	☐
56.	Students would carry out history inquiry to answer questions which puzzled them.	☐	☐	☐	☐	☐
57.	The same teaching aid (e.g. blackboard or overhead projector) would be used for all students in the class.	☐	☐	☐	☐	☐

Please proceed to the next page

Section 3: <u>LEARNING APPROACHES IN THE HISTORY CLASSROOM</u>

Please mark the box that corresponds to your answer with an "**X**".

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Stronglagree (5)
58.	I study history mainly because of career prospects when I leave school, not because I'm particularly interested in them	☐	☐	☐	☐	☐
59.	I find that at times my school work can give me a feeling of deep personal satisfaction.	☐	☐	☐	☐	☐
60.	I try to obtain high marks in all my subjects because of the advantage this gives me in competing with others when I leave school.	☐	☐	☐	☐	☐
61.	I tend to study only what's set, I usually don't do anything extra.	☐	☐	☐	☐	☐
62.	While I am studying, I often try to think of how useful the material to understand what happening in the real life.	☐	☐	☐	☐	☐
63.	I regularly take notes from suggested readings and put them with my class notes on a topic.	☐	☐	☐	☐	☐
64.	I am put off by a poor mark on a test and worry about how I will do on the next test.	☐	☐	☐	☐	☐

65. While I realise that others sometimes know better than I do, I feel I have to say what I think is right. ☐ ☐ ☐ ☐ ☐

☐ ☐ ☐ ☐ ☐

66. I have strong desire to do best in history.

67. I find the only way to learn history is to memorise them my heart. ☐ ☐ ☐ ☐ ☐

68. In reading new material, I often reminded of material I already know and see that in a new light. ☐ ☐ ☐ ☐ ☐

69. I try to work solidly throughout the term and revise regularly when the exams are close. ☐ ☐ ☐ ☐ ☐

70. Whether I like it or not, I can see that studying is for me a good way to get a well-paid or secure job. ☐ ☐ ☐ ☐ ☐

71. I find that history can become very interesting once you get into them. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
72.	I like the results of test to be put up publicly so I can see by how much I beat some others in my class.	☐	☐	☐	☐	☐
73.	I prefer history lesson in which I have to learn just facts to ones which require a lot of reading and understanding of material.	☐	☐	☐	☐	☐
74.	I find that I have to do enough work on a topic so that I can form my own point of view before I am satisfied.	☐	☐	☐	☐	☐
75.	I always try to do all of my assignment as soon as they given to me.	☐	☐	☐	☐	☐
76.	Even when I have studied hard for a test, I worry that I may not be able to do well on it.	☐	☐	☐	☐	☐
77.	I find that studying history can be really exciting.	☐	☐	☐	☐	☐
78.	I would rather be highly successful in school even though this might make me unpopular with some of my classmates.	☐	☐	☐	☐	☐
79.	In history I try to work things so that I just pass, and nothing more.	☐	☐	☐	☐	☐
80.	I try to relate what I have learned in history to what I already know in other subjects.	☐	☐	☐	☐	☐
81.	Soon after a class, I re-read my notes to make sure I can read them and understand them.	☐	☐	☐	☐	☐

82. I think that the teachers shouldn't expect secondary school students to work on topics that are outside the set subject. ☐ ☐ ☐ ☐ ☐

83. I feel that I might one day be able to change things in the world that I see now to be wrong. ☐ ☐ ☐ ☐ ☐

84. I will work for top marks in history whether or not I like the subject. ☐ ☐ ☐ ☐ ☐

85. I find it better to learn just the facts and details about a topic in history rather than try to understand all about it. ☐ ☐ ☐ ☐ ☐

Please proceed to the next page

	Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
86. I find most new history topics interesting and often spend extra time tyring to find out more about them.	☐	☐	☐	☐	☐
87. When a test is returned, I go over it carefully correcting all errors and trying to understand why I made the original mistakes.	☐	☐	☐	☐	☐
88. I will continue my studies only for as long as necessary to get a good job.	☐	☐	☐	☐	☐
89. My main aim in life is to find out what to believe in and then to act accordingly.	☐	☐	☐	☐	☐
90. I see doing well in school as a sort of game, and I play to win.	☐	☐	☐	☐	☐
91. I don't spend time on learning things that I know won't be asked in the exams.	☐	☐	☐	☐	☐
92. I spend a great deal of my free time finding out more about interesting topics which have been discussed in different classes.	☐	☐	☐	☐	☐
93. I usually try to read all the references and things my teacher says we should.	☐	☐	☐	☐	☐

Please proceed to the next page

Section 4: STUDENTS' PERCEPTIONS OF HISTORY

Please mark the box that corresponds to your answer with an "**X**".

I believe that studying of history is helping me become better at:

		Strongly disagree (1)	Disagree (2)	No opinion (3)	Agree (4)	Strongly agree (5)
94.	Stating the important of history as a discipline of knowledge and applying it in lifelong learning.	☐	☐	☐	☐	☐
95.	Being able to explain the political, economic, and social development in Malaysian society.	☐	☐	☐	☐	☐
96.	Describing the social culture characteristics of Malaysia.	☐	☐	☐	☐	☐
97.	Practising the social culture characteristics of Malaysia in your daily life.	☐	☐	☐	☐	☐
98.	Appreciating the efforts and the contributions of individuals who struggled for the sovereignty, independence and development of the country.	☐	☐	☐	☐	☐
99.	Defending the dignity of the Malaysian races.	☐	☐	☐	☐	☐
100.	Processing the spirit of patriotism and participation in the efforts to defend to sovereignty, development and progress of the country.	☐	☐	☐	☐	☐
101.	Learn from the experience in history in order to enhance my thinking ability and maturity.	☐	☐	☐	☐	☐
102.	Practising moral values.	☐	☐	☐	☐	☐
103.	Analysing, summarising and evaluating rationally the history of Malaysia and the world.	☐	☐	☐	☐	☐

THIS IS THE END OF THE QUESTIONNAIRE

Thank You

for completing this questionnaire

Appendix 3- Ethics Clearance (University of Adelaide)

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

RESEARCH BRANCH
RESEARCH ETHICS AND COMPLIANCE UNIT

SABINE SCHREIBER
SECRETARY
HUMAN RESEARCH ETHICS COMMITTEE

THE UNIVERSITY OF ADELAIDE
SA 5005
AUSTRALIA

TELEPHONE +61 8 8303 6028
FACSIMILE +61 8 8303 7325
email: sabine.schreiber@adelaide.edu.au
CRICOS Provider Number 00123M

Applicant:	Dr IN Darmawan
Department:	School of Education
Project Title:	*An investigation into possible differences between qualified and 'out-of-field' history teachers in Malaysia secondary schools*

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

Project No: **H-173-2009** RM No: 0000009622

APPROVED for the period until: 31 December 2010

It is noted that this study will be conducted by Ms Umi Kalsum Mohd Salleh, PhD candidate.

Refer also to the accompanying letter setting out requirements applying to approval.

Professor Garrett Cullity
Convenor
Human Research Ethics Committee

Date: 10 DEC 2009

Page 1 of 1

THE UNIVERSITY
OF ADELAIDE
AUSTRALIA

RESEARCH BRANCH
RESEARCH ETHICS AND COMPLIANCE UNIT

SABINE SCHREIBER
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CRICOS Provider Number 00123M

10 December 2009

Dr IN Darmawan
School of Education

Dear Dr Darmawan

PROJECT NO: *An investigation into possible differences between qualified and 'out-of-field'*
H-173-2009 *history teachers in Malaysia secondary schools*

I write to advise you that I have approved the above project on behalf of the the Human Research Ethics Committee. Please refer to the enclosed endorsement sheet for further details and conditions that may be applicable to this approval.

Approval is current for one year. The expiry date for this project is: 31 December 2010

Where possible, participants taking part in the study should be given a copy of the Information Sheet and the signed Consent Form to retain.

Please note that any changes to the project which might affect its continued ethical acceptability will invalidate the project's approval. In such cases an amended protocol must be submitted to the Committee for further approval. It is a condition of approval that you immediately report anything which might warrant review of ethical approval including (a) serious or unexpected adverse effects on participants (b) proposed changes in the protocol; and (c) unforeseen events that might affect continued ethical acceptability of the project. It is also a condition of approval that you inform the Committee, giving reasons, if the project is discontinued before the expected date of completion.

A reporting form is available from the Committee's website. This may be used to renew ethical approval or report on project status including completion.

Yours sincerely

per Professor Garrett Cullity
Convenor
Human Research Ethics Committee

THE UNIVERSITY OF ADELAIDE AUSTRALIA

SCHOOL OF EDUCATION

Level 8, 10 Pulteney Street, University of Adelaide, Adelaide SA 5005; Tel: (+618) 8303 5628, Fax: (+618) 8303 3604

RESEARCH PROJECT INFORMATION SHEET

I am Umi Kalsum Mohd Salleh, a research scholar in the School of Education at the University of Adelaide. I am presently undertaking research leading to the production of a thesis on the subject **An Investigation into possible differences between qualified and 'out-of-field' history teachers in Malaysia secondary schools.**

You will be asked to complete a questionnaire in the specified timeframes during your homeroom class:

- Teachers' Questionnaire (with approximate time allocation for each section shown)
  - *General Information* items - 5 minutes
  - Items about *Teachers' Conception of Teaching* - 10 minutes
  - ~~Items about *History Teaching* - 10 minutes~~
  - Items about *Teachers' Approaches to Teaching* - 10minutes
  - Items about *History Teaching Methods* - 10 minutes

- Students' Questionnaire (with approximate time allocation for each section shown)
  - *General Information* items - 5 minutes
  - Items about *Classroom of Climate* - 10 minutes
  - Items about *Approaches to Learning History* - 10 minutes
  - Items about Students' *Perception of History* - 10 minutes

Questionnaires will be collected by the teacher about 5 minutes before class ends.

The main goal of this research is to investigate the possible differences between qualified and out-of-field history teachers in Malaysia It specifically aims to investigate the effect of out-of-field teachers' conceptions on classroom practice, including how those conception influences the way students experience learning history in the classroom. In addition this study also attempts to investigate students' perceptions of their learning environment to determine the effect of out-of-field teaching in this environment. This project is intended to further the research that has already been conducted on this topic, but from micro level perspectives.

From this project I hope to develop a causal model of the different conceptions of history teaching in the classroom that may have influence on students' perceptions of learning history in the classroom. If successful, results from this study should provide both educationalists and policy makers a significant amount of useful information and a deeper understanding of teachers' and students' teaching and learning of history.

Be assured that any information provided will be treated in the strictest confidence and neither participants nor schools will be individually identifiable in the resulting thesis, report or other publications. Participants are, of course, entirely free to discontinue their participation at any time or to decline to answer particular questions in the study. Since participation is purely voluntary, non-participation will not affect students' academic progress in any way.

In this project, I intend to make a recording of any student or teacher interviews. Therefore, I will seek the consent of the students and parents of students (who are under 18 years old), and teachers to record the interview, to use the recording or a transcription in preparing the thesis, report or other publications, on condition that names or identities are not revealed.

Should you require additional information regarding this research, please contact me by telephone on (+618) 8303-6064, mobile (+61)421-601-056, or email umi.mohdsalleh@adelaide.edu.au. Should I be unavailable, my supervisor, Dr. Darmawan Ngurah I Gusti, can also be contacted at the address and telephone given above or at (+618) 8303-5788 and email igusti.darmawan@adelaide.edu.au.

Please see the attached independent complaints procedure form should you have any complaints about this project.

Thank you for considering this request.

Signed,

Umi Kalsum Mohd Salleh

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

STANDARD CONSENT FORM
For Research to be Undertaken on a Child, the Mentally Ill, and those in Dependant Relationships or Comparable Situations
To be Completed by Parent or Guardian

1. I, ……………………………………………………………………………… *(please print name)*

   consent to allow …………………………………………………………….. *(please print name)*

   to take part in the research project entitled:

   "An investigation into possible differences between qualified and 'out-of-field' history teachers in Malaysia secondary schools"

2. I acknowledge that I have read the attached Information Sheet entitled:

   Research Project Information Sheet

   and have had the project, as far as it affects …………………………………… *(name)*
   fully explained to me by the research worker. My consent is given freely.

   IN ADDITION, I ACKNOWLEDGE THE FOLLOWING ON BEHALF OF

   ………………………………………………………………………………………… *(name)*

3. Although I understand that the purpose of this research project is to improve the quality of medical care, it has also been explained to me that involvement may not be of any benefit to him/her.

4. I have been given the opportunity to have a member of his/her family or friend present while the project was explained to me.

5. I have been informed that the information he/she provides will be kept confidential.

6. I understand that he/she is free to withdraw from the project at any time and that this will not affect medical advice in the management of his/her health, now or in the future.

7. I am aware that I should retain a copy of this Consent Form, when completed, and the attached Information Sheet.

   ……………………………………………Parent/Guardian ………………………………………
   (signature and please indicate relationship) *(date)*

WITNESS

I have described to ……………………………………………… *(name of parent/guardian)*

the nature of the research to be carried out. In my opinion she/he understood the explanation.

Status in Project: **Active/ Inactive**

Name: ……………………………………………………………………………………………

……………………………………………………………………………………………………
(signature) *(date)*

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

STANDARD CONSENT FORM
FOR PEOPLE WHO ARE PARTICIPANTS IN A RESEARCH PROJECT

1. I, ... *(please print name)*

consent to take part in the research project entitled:

"An investigation into possible differences between qualified and 'out-of-field' history teachers in Malaysia secondary schools"

2. I acknowledge that I have read the attached Information Sheet entitled:

Research Project Information Sheet

3. I have had the project, so far as it affects me, fully explained to my satisfaction by the research worker. My consent is given freely.

4. Although I understand that the purpose of this research project is to improve the quality of medical care, it has also been explained that my involvement may not be of any benefit to me.

5. I have been given the opportunity to have a member of my family or a friend present while the project was explained to me.

6. I have been informed that, while information gained during the study may be published, I will not be identified and my personal results will not be divulged.

7. I understand that I am free to withdraw from the project at any time and that this will not affect medical advice in the management of my health, now or in the future.

8. I am aware that I should retain a copy of this Consent Form, when completed, and the attached Information Sheet.

....
(signature) *(date)*

WITNESS

I have described to .... *(name of subject)*

the nature of the research to be carried out. In my opinion she/he understood the explanation.

Status in Project: **Active/ Inactive**

Name: ....

....
(signature) *(date)*

Appendix 3- Ethics Clearance (Malaysia)

UNIT PERANCANG EKONOMI
Economic Planning Unit
JABATAN PERDANA MENTERI
Prime Minister's Department
BLOK B5 & B6
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62502 PUTRAJAYA
MALAYSIA

EPU

Telefon : 603-8888 3333

Ruj. Tuan:
Your Ref.:

Ruj. Kami:
Our Ref.: UPE: 40/200/19/2546

Tarikh:
Date: 27 January 2010

Umi Kalsum Mohd Salleh
AL-8 Jalan Tioman 2
Taman setapak
53000 Kuala Lumpur.
Email: umisalleh@gmail.com

APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application, I am pleased to inform you that your application to conduct research in Malaysia has been *approved* by the **Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister's Department.** The details of the approval are as follows:

Researcher's name :	**UMI KALSUM MOHD SALLEH**
Passport No. / I. C No:	**660908-04-5430**
Nationality :	**MALAYSIAN**
Title of Research :	**"AN INVESTIGATION INTO POSSIBLE DIFFERENCES BETWEEN QUALIFIED AND 'OUT-OF-FIELD' HISTORY TEACHERS IN MALAYSIAN SECONDARY SCHOOL"**

Period of Research Approved: **THREE YEARS**

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister's Department, Parcel B, Level 4 Block B5, Federal Government Administrative Centre, 62502 Putrajaya and bring along two (2) passport size photographs. You are also required to comply with the rules and regulations stipulated from time to time by the agencies with which you have dealings in the conduct of your research.

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:

a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

(**MUNIRAH ABD. MANAN**)
For Director General,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88882809
Fax: 88883961

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass**.

Cc:

Pengarah
Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pelajaran Malaysia
Aras 1-4, Blok E-8
Kompleks Kerajaan Parcel E
Pusat Pentadbiran Kerajaan Persekutuan
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JABATAN PELAJARAN WILAYAH PERSEKUTUAN KUALA LUMPUR
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JPWP 12-21/Jld.6 - 09/(87)
26 MAC 2010

Umi Kalsum Mohd Salleh
AL - 8 Jalan Tioman 2 Taman Setapak
53000 Kuala Lumpur

Y. Bhg. Dato/Datin/Tuan/Puan,

KEBENARAN UNTUK MENJALANKAN KAJIAN DI SEKOLAH-SEKOLAH, MAKTAB-MAKTAB PERGURUAN, JABATAN-JABATAN PELAJARAN DAN BAHAGIAN-BAHAGIAN DI BAWAH KEMENTERIAN PELAJARAN MALAYSIA

Dengan hormatnya saya diarah memaklumkan bahawa permohonan Y. Bhg. Dato/Datin/Tuan/Puan untuk menjalankan kajian bertajuk :-

" An Investigation Into Possible Differences Between Qualified And ' Out-Of-Field' History Teachers In Malaysia Secondary Schools'
adalah diluluskan tertakluk kepada syarat-syarat berikut:-

a) Kelulusan ini adalah berdasarkan kepada apa yang terkandung di dalam cadangan penyelidikan yang telah diluluskan oleh Kementerian Pendidikan Malaysia.
b) Sila kemukakan surat kebenaran ini ketika berurusan dengan Pengetua/Guru Besar sekolah berkenaan.
c) Kelulusan ini untuk sekolah-sekolah di Wilayah Persekutuan Kuala Lumpur sahaja
d) Y. Bhg. Dato/Datin/Tuan/Puan dikehendaki mengemukakan senaskah hasil kajian tuan/puan ke Jabatan ini sebaik sahaja ianya siap sepenuhnya.
e) Kebenaran ini sah sehingga 31.12.2010

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(SITI HALIMAH BT SYED NORDIN)
Penolong Pendaftar Sekolah
Jabatan Pelajaran Wilayah Persekutuan
b.p Ketua Pendaftar Sekolah & Guru
Kementerian Pelajaran Malaysia

Bibliography

Acock, A. C. (2005). Working with missing values. *Journal of Marriage and Family, 67*(4), 1012-1028.

Aini, H., & Wan Hasmah, W. M. (2007). Mengajar di luar bidang pengkususan: Sejauh manakah seriusnya masalah ini di Malaysia? (Out-of-field teaching: How series this problems in Malaysia?). *Jurnal pendidikan 2007. Jilid, 27*(1), 149-163.

Alagumalai, S., & Curtis, D. D. (2005). Classical test theory. In S. Alagumalai, D. D. Curtis & N. Hungi (Eds.), *Applied Rasch Measurement: A book of exemplars* (pp. 1-14). Dordrecht, The Netherlands: Springer.

Allison, P. D. (2002). *Missing data series: Quantitative applications in the social sciences*. Thousand Oaks, CA: Sage.

Anne, N., Seppo, T., & Shoji, N. (2010). University teachers' approaches to teaching and their pedagogical use of ICTs: A comparative case study of Finland, Japan and India. *US-China Education Review, 7*(7), 1-14.

Arbuckle, J., & Wothke, W. (1999). *Amos 4.0 User's Guide*. Chicago: Smallwaters Corporation.

Arbuckle, J. L. (2008). AMOS 17.0 [Computer Software]. Spring House, PA: Amos Corporation.

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review, 5*(3), 243-260. doi: http://dx.doi.org/10.1016/j.edurev.2010.06.001

Banaszynski, J. (2000). Teaching the American Revolution: Scaffolding to success. In *Education world: The educator's best friend*. Retrieved 2012, October 16, from http://www.educationworld.com/a_curr/curr218.shtml

Barton, K. C. (2004). Research on students' historical thinking and learning. *Perspectives*. Retrieved from American Historical Association website: http://www.historians.org/perspectives/issues/2004/0410/0410tea1.cfm

Becker, H. J. (2000). *Secondary teachers of mixed academic subjects: "Out-of-Field" problem or constructivist innovators*. Paper presented at the The 2000 meetings of the American Educational Research Association, Irvine, CA.

Ben, F. (2010). *Students' uptake of physics: A study of South Australian and Filipino physics students.* (Doctoral thesis), University of Adelaide, Australia.

Biggs, J. (1987). *Student approaches to learning and studying*. Hawthorn, Victoria: Australian Council for Educational Research.

Biggs, J. B. (1978). Individual and group differences in study processes. *British Journal of Educational Psychology, 48*(3), 266-279.

Biggs, J. B. (1985). The role of metalearning in study processes. *British Journal of Educational Psychology, 55*(3), 185-212.

Biggs, J. B. (2001). Enhancing learning: The matter of style or approach? In R. J. Sternberg & L. F. Zhangs (Eds.), *Perspective on thinking, learning, and cognitive style* (pp. 73-102). Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Biggs, J. B. (2003). *Teaching for quality learning at university: What the student does* (2nd ed.). Buckingham: Open University Press.

Biggs, J. B., & Moore, P. J. (1993). *The process of learning* (3rd ed.). New York ; Sydney: Prentice Hall.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Bollen, K. A., & Long, J. S. (1993). *Testing structural equation models*. Newbury Park, CA: Sage Publications.

Booth, A. (2003). *Teaching history at university: enhancing learning and understanding*. New York: Routledge.

Bransford, J. (2000). *How people learn: brain, mind, experience, and school* (Expanded ed.). Washington, D.C.: The National Academy Press.

Braun, H., Jenkins, F., & Grigg, W. (2006). *Comparing private schools and public schools using hierarchical linear modeling*. (NCES 2006-461). Washington, D.C.: U.S. Government Printing Office

Brown, M., & Kros, J. (2003). Data mining and the impact of missing data. *Industrial Management and Data Systems, 103*(8), 611-621.

Bryk, A., & Raudenbush, S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). London: Sage Publications.

Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical Linear Models: Applications and data analysis method*. Newbury Park, CA: Sage Publications.

Byrne, B. M. (2001). *Structural equation modeling with AMOS: basic concepts, applications, and programming*. Mahwah, N.J.: Lawrence Erlbaum Associates.

Byrne, B. M. (2003). Confirmatory factor analysis. In R. Fernandez-Ballesteros (Ed.), *Encyclopedia of psychological assessment* (Vol. 1, pp. 399-402). Thousand Oaks, CA: Sage Publications.

Byrne, B. M. (2005). Factor Analytic Models: Viewing the structure of an assessment instrument from three perspectives. [Article]. *Journal of Personality Assessment, 85*(1), 17-32. doi: 10.1207/s15327752jpa8501_02

Byrne, B. M. (2010). *Structural Equation Modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). New Jersey: Lawrence Erlbaum Associates.

Chapman, D. W., Chen, X., & Postiglione, G. A. (2000). Is preservice teacher training worth the money? A study of teachers in ethnic minority regions of the People's Republic of China. *Comparative Education Review, 44*(3), 300-328. doi: 10.1086/447616

Cleveland, D. (2003). Introduction. *The High School Journal, 86*(3), 1-7. doi: 10.1353/hsj.2003.0001

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

Commonwealth History Project, & Department of Education Science and Training. (2002). The National Centre of History Education. Retrieved 2012, November 11, from http://www.hyperhistory.org/

Covino, E. A., & Iwanicki, E. F. (1996). Experienced teachers: Their constructs of effective teaching. *Journal of Personnel Evaluation in Education, 10*(4), 325-363.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Cronbach, L. J., Nanda, H., & Rajaratnam, N. (1972). *The dependability of behavioral measurements: Theory of generalizability for scores and profiles*. New York: Wiley.

Curtis, D. D. (2004). Comparing classical and contemporary analyses and Rasch Measurement. In S. Alagumalai, D. D. Curtis & N. Hungi (Eds.), *Applied Rasch Measurement: A book of exemplars* (pp. 181-187). Dordrecht, The Netherlands: Springer.

Curtis, D. D. (2005). Classical test theory. In S. Alagumalai, D. D. Curtis & N. Hungi (Eds.), *Applied Rasch Measurement: A book of exemplars* (pp. 179-195). Dordrecht, The Netherlands: Springer.

Dall'Alba, G. (1990). Foreshadowing conceptions of teaching. *Research and Development in Higher Education, 13*(1990), 293-297.

Darmawan, I. G. N. (2003). *Implemention of Information Technology in Local Government in Bali, Indonesia*. Adelaide, SA: Shannon Research Press.

Darmawan, I. G. N., & Keeve, J. P. (2009). The use of path analysis with latent variables. In C. R. Aldous (Ed.), *The learning of numeracy and literacy in South Australian primary schools*. Adelaide, SA: Shannon Research Press.

Dart, B. (1994). A goal-mediational model of personal and environmental influences on tertiary students' learning strategy use. *Higher Education, 28*(4), 453-470. doi: 10.1007/bf01383937

Dart, B. (1997). Adult learners' metacognitive behaviour in higher education. In P. Sutherland (Ed.), *Adult learning: A reader* (pp. 30-43). London: Kogan Page.

Dart, B., Burnett, P., Boulton-Lewis, G., Campbell, J., Smith, D., & McCrindle, A. (1999). Classroom learning environments and students' approaches to learning. *Learning Environments Research, 2*(2), 137-156. doi: 10.1023/a:1009966107233

Dart, B., Burnett, P., Purdie, N., Boulton-Lewis, G., Campbell, J., & Smith, D. (2000). Students' conceptions of learning, the classroom environment, and approaches to learning. *The Journal of Educational Research, 93*(4), 262-270.

Dee, T. S., & Cohodes, S. R. (2008). Out-of-field teachers and student achievement: Evidence from matched-pairs comparisons. *Public Finance Review, 36*(1), 7-32. doi: 10.1177/1091142106289330

Department of Statistics Malaysia. (2010). Department of Statistics, Malaysia: Official website. Retrieved 2011, January 5, from http://www.statistics.gov.my/portal

Devlin, M. (2006). Challenging accepted wisdom about the place of conceptions of teaching in university teaching improvement. *International Journal of Teaching and Learning in Higher Education, 18*(2), 112-119.

Diamantopoulos, A. D., & Siguaw, J. A. (2000). *Introducing LISREL: A guide for the uninitiated*. London: Sage Publications.

Drake, S. E. (2003). *State certification requirements for history teachers*. Bloomington, IN: ERIC Document Reproduction Service No. ED482210.

Eley, M. G. (2006). Teachers' conceptions of teaching, and the making of specific decisions in planning to teach. *Higher Education, 51*(2), 191-214. doi: 10.1007/s10734-004-6382-9

Ellis, R. A., Goodyear, P., Calvo, R. A., & Prosser, M. (2008). Engineering students' conceptions of and approaches to learning through discussions in face-to-face and online contexts. *Learning and Instruction, 18*(3), 267-282. doi: http://dx.doi.org/10.1016/j.learninstruc.2007.06.001

Entwistle, N., & Ramsden, P. (1983). *Understanding student learning*. London: Croom Helm.

Entwistle, N., & Tait, H. (1990). Approaches to learning, evaluations of teaching, and preferences for contrasting academic environments. *Higher Education, 19*(2), 169-194. doi: 10.1007/bf00137106

Evans, I. M., Harvey, S. T., Buckley, L., & Yan, E. (2009). Differentiating classroom climate concepts: Academic, management, and emotional environments. *Kotuitui: New Zealand Journal of Social Sciences Online, 4*(2), 131-146. doi: 10.1080/1177083x.2009.9522449

Evans, R. W. (1988). Lessons from history: Teacher and student conceptions of the meaning of history. *Theory & Research in Social Education, 16*(3), 203-225. doi: 10.1080/00933104.1988.10505565

Evans, R. W. (1990). Teacher conceptions of history revisited: Ideology, curriculum, and student belief. *Theory & Research in Social Education, 18*(2), 101-138. doi: 10.1080/00933104.1990.10505608

Falk, R. F. (1987). *A primer for soft modeling*. Berkeley, CA: Institute of Human Development, University of California.

Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. Akron, Ohio: University of Akron Press.

Fox, D. (1983). Personal theories of teaching. *Studies in Higher Education, 8*(2), 151-163. doi: 10.1080/03075078312331379014

Fraser, B. J. (1989). Twenty years of classroom climate work: progress and prospect. *Journal of Curriculum Studies, 21*(4), 307-327. doi: 10.1080/0022027890210402

Fraser, B. J. (1990). *Individualised classroom environment questionnaire: Handbook and test master set*. Brisbane: Australian Council for Educational Research.

Fraser, B. J. (1998). Science learning environments: Assessment, effects and determinants. In B. J. Fraser & K. G. Tobin (Eds.), *International handbook of science education* (pp. 527-564). Dordrecht, The Netherlands: Kluwer.

Friedman, S. J. (2000). Research news and comment: How much of a problem? A reply to Ingersoll's "The problem of underqualified teachers in America secondary school" *Educational Researcher, 29*(18), 18-20.

Furnham, A., Christopher, A. N., Garwood, J., & Martin, G. N. (2007). Approaches to learning and the acquisition of general knowledge. *Personality and Individual Differences, 43*(6), 1563-1571.

Gao, L., & Watkins, D. A. (2002). Conceptions of teaching held by school science teachers in P.R. China: Identification and cross-cultural comparisons. *International Journal of Science Education, 24*(1), 61-79. doi: 10.1080/09500690110066926

Gardner, H., & Boix Mansilla, V. (1994). Teaching for understanding in the disciplines and beyond. *Teachers College Record, 96*(2), 198-218.

Gavin , M. B., & Hofmann , D. A. (2002). Using hierarchical linear modeling to investigate the moderating influence of leadership climate. *The Leadership Quarterly, 13*(1), 15-33. doi: 10.1016/S1048-9843(01)00102-3

Goldhaber, D. D., & Brewer, D. J. (1997). Why don't schools and teachers seem to matter? Assessing the impact of unobservables on educational productivity. *The Journal of Human Resources, 32*(3), 505-523.

Goodman, J., & Adler, S. (1985). Becoming an elementary social studies teacher: A study of perspectives. *Theory & Research in Social Education, 13*(2), 1-20.

Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hall, J. K. (2001). *Methods for teaching foreign languages: creating a community of learners in the classroom*. Upper Saddle River, NJ: Prentice-Hall/Merrill.

Harris, K. L., & Jensz, F. (2006). The preparation of mathematics teachers in Australia: Meeting the demand of the suitably qualified mathematic teachers in secondary schools *Report prepared for the Australian Council of Deans of Science*. Melbourne: Centre of the Study of Higher Education, The University of Melbourne. Retrieved from www. acds. edu. au/docs/Prep_Math_Teach_Aust. pdf

Harris, M. J. (1997). Values and citizenship education in Malaysia. In K. J. Kennedy (Ed.), *Citizenship education and the modern state* (pp. 96-106). London: The Falmer Press.

Hayden, T., Arthur, J., & Hunt, M. (1997). *Learning to teach history in the secondary school: a companion to school experience*. London; New York: Routledge.

Heise, D. R. (1975). *Causal analysis*. New York: John Wiley and Sons Inc.

Hox, J. J. (2002). *Multilevel analysis: Techniques and applications*. Mahwah, NJ: Lawrence Erlbaum Associates.

SPSS Inc. (2008). SPSS for Windows (Version 17.0) [Statistical Analysis Program]. Chicago: SPSS Inc.

Ingersoll, R. (1998). The problem of out-of-field teaching. *Phi Delta Kappan, 79*(10), 773-776.

Ingersoll, R. (1999). The problem of underqualified teachers in American secondary schools. *Educational Researcher, 28*(2), 26-37.

Ingersoll, R. (2007). *A Comparative study of teacher preparation and qualifications in six nations*. Philadelphia, PA: Consortium for Policy Research in Education, University of Pennsylvania.

Ingersoll, R., & Merrill, E. (2011). The status of teaching as a profession. In J. Ballantine & J. Spade (Eds.), *Schools and society: A sociological approach to education* (4th ed., pp. 185-189). CA: Pine Forge Press/Sage Publications.

Ingersoll, R. M. (2000). Out-of-field teaching. *ERIC Digest (ERIC Document Reproduction Service No ED449119)*.

Ingersoll, R. M. (2001). Rejoinder: Misunderstanding the problems of out-of-teaching. *Educational Researcher, 30*(1), 21-22.

Ingersoll, R. M. (2003). Out-of-field teaching and the limits of teacher policy. Seattle, WA: Centre for the Study of Teaching and Policy and the Consortium for Policy Research in Education, University of Washington. Retrieved from http://depts.washington.edu/ctpmail/PDFs?LimitsPolicy-RI-09-2003.pdf

Jerald, C. D., & Ingersoll, R. (2002). All talk no action: Putting and end to out-of-field teaching (pp. 1-15). Philadelphia, PA: University of Pennsylvania Scholarly Commons. Retrieved from http://repository.upenn.edu/cgi/viewcontent.cgi?article=1142&context=gse_pubs

Jones, M. G., & Braden-Ajare, L. (2002). The impact of constructivism on education: Language, discourse and meaning. *American Communication Journal, 5*(3). Retrieved from http://www.acjournal.org/holdings/vol5/iss3/special/jones.htm

Jöreskog, K., & Sörbom, D. (1993). *LISREL 8: Structural Equation Modeling with the SIMPLIS command language*. Chicago, IL: Scientific Software International.

Keeves, J. (1997). Models and model building. In J.Keeves (Ed.), *Educational research, methodology, and measurement: an international handbook* (pp. 386-394). Oxford: Pergamon.

Keeves, J. (1997). Multivariate analysis. In J.Keeves (Ed.), *Educational research, methodology, and measurement: an international handbook* (pp. 403–412). Oxford: Pergamon.

Keeves, J. P. (1986). Aspiration, motivation and achievement: Different methods of analysis and different results. *International Journal of Educational Research, 10*, 117-243.

Keeves, J. P. (2002). Learning in schools: a modelling approach. *International Education Journal, 3*(2), 114-125.

Kek, M., & Huijser, H. (2011). Exploring the combined relationships of student and teacher factors on learning approaches and self-directed learning readiness at a Malaysian university. *Studies in Higher Education, 36*(2), 185-208. doi: 10.1080/03075070903519210

Kek, Y. C. (2006). *Individual characteristics, family, self-efficacy, curriculum, university and classroom learning environments, teaching approaches and teacher factors, learning approaches, and student outcomes in a Malaysian private university: A mixed research study.* (Doctoral thesis), University of Adelaide, Adelaide, SA.

Kember, D. (1997). A reconceptualisation of the research into university academics' conceptions of teaching. *Learning and Instruction, 7*(3), 255-275. doi: http://dx.doi.org/10.1016/S0959-4752(96)00028-X

Kember, D., & Gow, L. (1994). Orientations to teaching and their effect on the quality of student learning. *Journal of Higher Education, 65*, 58-73.

Kember, D., & Kwan, K. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. In N. Haitiva & P. Goodyear (Eds.), *Teacher thinking, belief and knowledge in higher education* (pp. 219-240). Dordrecht, The Netherlands: Kluwer.

Kember, D., & Leung, Y. P. D. (2005). The influence of active learning experience on th development of graduate capabilities. *Studies in Higher Education, 30*(2), 155-170.

Kember, D., & Wong, A. (2000). Implications for evaluation from a study of students' perceptions of good and poor teaching. *Higher Education, 40*(1), 69-97. doi: 10.1023/a:1004068500314

Kenny, D. A. (1979). *Correlation and causality*. New York: John Willey and Sons Inc.

Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: The Guilford Press.

Knight, G. A. (1997). Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation. *Journal of Business Venturing, 12*(3), 213-225. doi: http://dx.doi.org/10.1016/S0883-9026(96)00065-1

Kvale, S. (1995). The social construction of validity. *Qualitative Inquiry, 1*(1), 19-40. doi: 10.1177/107780049500100103

Lahey, B. B., McNealy, K., Knodt, A., Zald, D. H., Sporns, O., Manuck, S. B., Flory, J. D., Applegate, B., Rathouz, P. J., & Hariri, A. R. (2012). Using confirmatory factor analysis to measure contemporaneous activation of defined neuronal networks in functional magnetic resonance imaging. *NeuroImage, 60*(4), 1982-1991. doi: http://dx.doi.org/10.1016/j.neuroimage.2012.02.002

Land, K. C. (1969). Principles of path analysis. *Sociological Methodology, 1*, 3-37.

Lau, W. W. F., & Yuen, A. H. K. (2011). Modelling programming performance: Beyond the influence of learner characteristics. *Computers & Education, 57*(1), 1202-1213. doi: http://dx.doi.org/10.1016/j.compedu.2011.01.002

Leung, D. Y. P., & Kember, D. (2003). The relationship between the approaches to learning and reflection upon practice. *Educational Psychology: An International Journal of Experimental Educational Psychology, 23*(1), 61-71.

Levstik, L. S. (1996). Negotiating the history landscape. *Theory and Research in Social Education, 24*(4), 393-397.

Levstik, L. S., & Barton, K. (2001). *Doing history: Investigating with children in elementary and middle schools* (2nd Edition ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Lindblom-Ylänne, S., Trigwell, K., Nevgi, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education, 31*(3), 285-298. doi: 10.1080/03075070600680539

Lizzio, A., Wilson, K., & Simons, R. (2002). University student' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education,* 27(1), 27-52.

Lingbiao, G., & Watkins, D. (2001). Identifying and assessing the conceptions of teaching of secondary school physics teachers in China. *British Journal of Educational Psychology, 71*(3), 443-469. doi: 10.1348/000709901158613

Lingbiao, G., & Watkins, D. A. (2002). Conceptions of teaching held by school science teachers in P.R. China: Identification and cross-cultural comparisons.

International Journal of Science Education, 24(1), 61-79. doi: 10.1080/09500690110066926

Little, W., Fowler, H. W., Coulson, J., & Onions, C. T. (Eds.). (1933) The Shorter Oxford English Dictionary Vol 1 (A-M) (3rd ed.). Oxford: Clarendon Press.

Loehlin, J. C. (1992). *Latent variable models: An introduction to factor, path, and structural analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

MacAulay, D. J. (1990). Classroom environment: A literature review. *Educational Psychology, 10*(3), 239-253. doi: 10.1080/0144341900100305

Martin, E., & Balla, M. (1991). Conceptions of teaching and implications for learning. In B. Wright (Ed.), *Research and development in higher education* (pp. 298-304). Campbelltown, NSW: Higher Education Research and Development Society of Australasia (HERDSA).

Matthews, B. (2004). *Life values life approaches to learning*. Adelaide: Flinders University of South Australia.

McConney, A., & Price, A. (2009a). *An assessment of the phenomenon of "Teaching Out-of-Field" in WA Schools: Final Report*. Perth, WA: Western Australian College of Teaching(WACOT).

McConney, A., & Price, A. (2009b). Teaching out-of-field in Western Australia. *Australian Journal of Teacher Education, 34*(6), 86-98.

McKenzie, J. (1999). Scaffolding for success. *From Now On: The Educational Technology Journal, 9*(4). Retrieved from http://www.fno.org/dec99/scaffold.html

Ministry of Education Malaysia. (1991). Laporan kajian kedudukan pengajaran & pembelajaran mata pelajaran Sejarah di sekolah, Kuala Lumpur.

Ministry of Education Malaysia. (1993). Falsafah Pendidikan Negara. Dewan Bahasa & Pustaka. Kuala Lumpur.

Ministry of Education Malaysia. (2002). Sukatan Pelajaran Kurikulum Bersepadu Sekolah Menengah - Sejarah Tingkatan Empat, PPK. Kuala Lumpur.

Ministry of Human Resources. (2010). Malaysian Standard Classification of Occupations 2008 (3rd edition). Retrieved 2010, September 27, from http://www.jobsmalaysia.gov.my

Moos, R. H. (1980). *Evaluating educational environments: procedures, measures, findings and policy implications*. San Francisco: Jossey-Bass.

Moss, P. A. (1994). Can there be validity without reliability? *Educational Researcher, 23*(2), 5-12. doi: 10.3102/0013189x023002005

Nallaya, S. (2010). *The impact of multimodal texts on the development of English proficiency.* (Doctoral thesis), University of Adelaide, Adelaide, SA.

National Education Blueprint. (2007). Retrieved from http://www.moe.govmy/pustaka_jbt_pdf/2006/2007ppp-bab3pdf

Neuman, W. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Pearson Education.

Nunnally, J. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hil.

OECD (Organisation for Economic and Cultural Development). (2005). *Teachers matter: Attracting developing and retaining effective teachers.* Paris, France: OECD Publications.

OECD (Organisation for Economic and Cultural Development). (2009). *PISA data analysis manual: SPSS* (2nd ed.). Paris, France: OECD Publications.

Olitsky, S. (2006). Facilitating identity formation, group membership, and learning in science classrooms: What can be learned from out-of-field teaching in an urban school? In *Wiley Interscience*. Retrieved 2012, November 20, from http://www.interscience.wiley.com

Oppenheim, A. N. (2000). *Questionnaire design, interviewing and attitude measurement*. New York: Continuum.

Osborne, J. W. (2000). Advantages of hierarchical linear modeling. *Practical Assessment, Research & Evaluation, 7*(1). Retrieved from http://pareonline.net.proxy.library.adelaide.edu.au/getvn.asp?v=7&n=1

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332. doi: 10.3102/00346543062003307

Pallant, J. F. (2001). *SPSS survival manual: A step-by-step guide to data analysis using SPSS for Windows (Version 10)*. St Leonards, NSW: Allen & Unwin.

Pang, N. S. K. (1996). School values and teachers' feelings: A LISREL model. *Journal of Educational Administration, 34*(2), 64-83.

Patrician, P. A. (2002). Multiple imputation for missing data. *Research in Nursing & Health, 25*(1), 76-84. doi: 10.1002/nur.10015

Pedhazur , E. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Forth Worth, TX: Harcourt Brace College Publishers.

Peeraer, G., Donche, V., De Winter, B., Muijtjens, A., Remmen, R., Van Petegem, P., Bossaert, L., & Scherpbier, A. (2011). Teaching conceptions and approaches to teaching of medical school faculty: The difference between how medical school teachers think about teaching and how they say that they do teach. *Medical Teacher, 33*(7), 382-387.

Pratt, D. D. (1992). Conceptions of teaching. *Adult Education Quarterly, 42*, 203-320.

Prosser, M., Ramsden, P., Trigwell, K., & Martin, E. (2003). Dissonance in experience of teaching and its relation to the quality of student learning. *Studies in Higher Education, 28*(1), 37-48. doi: 10.1080/03075070309299

Prosser, M., & Trigwell, K. (1999). *Understanding learning and teaching* Buckingham: Open University Press.

Prosser, M., & Trigwell, K. (2006). Confirmatory factor analysis of the Approaches to Teaching Inventory. *British Journal of Educational Psychology, 76*(2), 405-419. doi: 10.1348/000709905x43571

Prosser, M., Trigwell, K., & Taylor, P. (1994). Qualitative difference in approaches to teaching first year university science. *Higher Education, 27*, 75-84.

Public Service of Department of Malaysia. (2008). Service Principle Number 6/2008 (Perkeliling Perkhidmatan Bilangan 6/2008). Retrieved from. Retrieved 2011, January 5 from http://www.jpa.gov.my/index

Qualification of the public school teacher workforce: Prevalence of out-of-field teaching, 1987-88 to 1999-2000. ERIC Document Reproduction Service No ED468740.

Rahimah, H. A. (1998). Educational development and reformation in Malaysia: Past, present and future. *Journal of Educational Administration, 36*(5), 462 - 475.

Ramsden, P. (1991). *Learning to teach in higher education*. London: Routledge.

Ramsden, P., Martin, E., & Bowden, J. (1989). School environment and sixth from pupils' approaches to learning. *British Journal of Educational Psychology, 59*(2), 129-142. doi: 10.1111/j.2044-8279.1989.tb03086.x

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. T., Jr. . (2004). *HLM 6: Hierarchical linear and nonlinear modeling*. Chicago: Scientific Software International.

Rintaningrum, R., Wilkinson, C., & Keeves, J. P. (2009). The use of path analysis with latent variables. In C. R. Aldous (Ed.), *The learning of numeracy and literacy in South Australian primary schools*. Adelaide, SA: Shannon Press.

Ríordáin, M. N., & Hannigan, A. (2011). Who teaches mathematics at second level in Ireland? *Irish Educational Studies, 30*(3), 289-304. doi: 10.1080/03323315.2011.569117

Ross, K. N. (2005). *Sample design for educational survey research*. France: UNESCO.

Samuelowicz, K., & Bain, J. (1992). Conceptions of teaching held by academic teachers. *Higher Education, 24*, 93-112.

Schafer, J. L. (1997). *Analysis of incomplete multivariate data*. New York: Chapman & Hall.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis result: A review. *Heldref Publication*, 323-327.

Seastrom, M. M., Gruber, K. J., Henke, R., D.J., M., & Cohen, B. A. (2002). *Qualification of the public school teacher workforce: Prevalence of out-of-field teaching, 1987-88 to 1999-2000*: ERIC Document Reproduction Service No ED468740.

Seixas, P. (1999). Beyond “content” and “pedagogy”: In search of away to talk about history education. *Journal of Curriculum Studies, 31*(3), 317–337.

Sekaran, U. (1992). *Research methods for business: A skill building approach* (2nd ed.). New York: John Wiley & Sons.

Selçuk, G. S. (2010). The effects of problem-based learning on pre-service teachers’ achievement, approaches and attitudes towards learning physics. *International Journal of Physical Sciences, 5*(6), 711-723.

Sellin, N. (1989). *PLSPATHS Version 3.01: Application manual*. Hamburg, West Germany: SPSS Inc. (2008).

Sellin, N. (1995). Partial least squares modeling in research in education achievement. In W. Bos & R. H. Lehmann (Eds.), *Reflections on education achievement* (pp. 256-267). Munster, Germany: Verlag.

Sellin, N., & Keeve, J. (1997). Path analysis with latent variables. In J. P. Keeve (Ed.), *Educational research, methodology, and measurement: An international handbook*. Oxford: Pergamon.

Sellin, N., & Keeves, J. P. (1997). Path analysis with latent variables. In T. Husen & T. N. Postlethwait (Eds.), *International encyclopedia of education* (2nd ed., pp. 4352-4259). New York: Pergamon.

Sharma, S., Bearden, W. O., & Netemeyer, R. G. (2003). *Scaling procedures: Issues and applications*. Thousand Oaks, CA: Sage Publications.

Sinkinson, A., & Jones, K. (2001). The validity and reliability of OFSTED judgements of the quality of secondary mathematics initial teacher training courses. *Cambridge Journal of Education, 31*(2), 221-237.

Sireci, S. G. (2007). On validity theory and test validation. *Educational Researcher, 36*(8), 477-481. doi: 10.3102/0013189x07311609

Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage Publications.

Suhr, D. D. (2006). *Exploratory or confirmatory factor analysis?* Paper presented at the The Thirtieth Annual SAS Users Group International Conference, Cary, NC.

Sulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 75*(2), 4-14.

Sulman, L. S. (1987). Knowledge and teaching: Foundation of the new reform. *Harvard Educational Review, 57*(2), 1-22.

Tanaka, J. S. (1993). Multifaceted conceptions of fit in structural equation models. In K. Bollen & J. Long (Eds.), *Testing structural equation models* (pp. 10-39). Newbury Park, CA: Sage Publications.

Tang, C. (1998). Effects of collaborative learning on the quality of assignments. In B. Dart & G. Boulton-Lewis (Eds.), *Teaching and learning in higher education* (pp. 102–123). Melbourne: Australia Council for Educational Research.

Taylor, T., & Young, C. (2003). *Making history: A guide for the teaching and learning of history in Australian schools*. Carlton South: Curriculum Corporation

Thomas, T. (2011). Remembering 500 years of colonialism, *The Malaysian Insider*. Retrieved from http://www.themalaysianinsider.com/print/sideviews/remembering-500-years-of-colonialism

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.

Thorndike, R. L. (1988). Reliability. In J. P. Keeves (Ed.), *Educational research, methodology, and measurement: An international handbook* (pp. 330-343). Oxford: Pergamon Press.

Torenbeek, M., Jansen, E. P. W. A., & Hofman, W. H. A. (2011). How is the approach to teaching at secondary school related to first-year university achievement? *School Effectiveness and School Improvement, 22*(4), 351-370. doi: 10.1080/09243453.2011.577788

Trigwell, K. (2012). Relations between teachers' emotions in teaching and their approaches to learning in higher education. *International Science, 40*(3), 667-621.

Trigwell, K., & Prosser, M. (2004). Development and use of the approaches to teaching inventory. *Educational Psychology Review, 16*(4), 409-424.

Trigwell, K., Prosser, M., & Ginns, P. (2005). Phenomenographic pedagogy and a revised 'Approaches to teaching inventory'. *Higher Education Research & Development, 24*(4), 349-360. doi: 10.1080/07294360500284730

Tuijnman, A. C., & Keeves, J. P. (1994). Path analysis and linear structural relationship analysis. In T. Husen & T. N. Postlethwait (Eds.), *International encyclopedia of education* (pp. 4339-4352). New York: Pergamon.

van Hover, S. D., & Yeager, E. A. (2003). "Making students better people?" A case study of a beginning history teacher. *International Social Studies Forum, 3*(1), 219-232.

van Teijlingen, E. R., & Hundley, V. (2001). The importance of pilot studies. In *Social Research Update*. Retrieved 2011, February 27 from http://sru.soc.surrey.ac.uk/SRU35.html

VanSledright, B. A. (1996). Closing the gap between school and disciplinary history? Historian as high school history teacher 6 (1996): . In J. Brophy (Ed.), *Advances in research on teaching: Teaching and learning history* (Vol. 6, pp. 257-289). Greenwich, CN: JAI Press.

Verenikina, I. (2008). Scaffolding and learning: its role in nurturing new learners. In P. Kell, W. Vialle, D. Konza & G. Vogl (Eds.), *Learning and the learner: exploring learning for new times* (pp. 161-180). Wollongong, NSW: University of Wollongong.

Vogt, W. P., & Johnson, R. B. (2011). *Dictionary of statistics & methodology: A nontechnical guide for the social sciences*. Newbury Park, CA: Sage Publications.

Wilhelm, J., Baker, T., & Dube, J. (2001). *Strategic reading: Guiding students to lifelong literacy 6-12*. Portsmouth, NH: Heinemann.

Wilson, K. (2003). *A constructivist approach to teaching reading: Turning the rhetoric into reality*. Paper presented at the The 16th EA Educational Conference 2003. www.englishaustralia.com.au/ea_connference03/proceedings/pdf/037F_Wilson

Wilson, S., & Wineburg, S. (1988). Peering at history with different lenses: The role of disciplinary perspectives in teaching history. *Teachers College Record, 89*, 525-539.

Wilson, S. M. (2001). Research on history teaching. In V. Richardson (Ed.), *Handbook of research on teaching* (4th ed., pp. 527-544). Washington, DC: American Educational Research Association.

Wineburg, S. M., & Wilson, S. M. (1991). Models of wisdom in teaching of history. *The History Teacher, 24*(4), 385-412.

Wold, H. (1985). Partial least squares. In S. Kotz & N. Johnson (Eds.), *Encyclopedia of Statistical Sciences* (Vol. 6, pp. 581–591). New York: Wiley.

Yilmaz, K. (2008). A vision of history teaching and learning: Thought on history education in secondary school. *The High School Journal*, 37-46.

Ylijoki, O.H. (1994). *"Students" conception of teaching and learning*. Paper presented at the The Society for Research into Higher Education Conference, York.

Yu, C. H. (n.d.). An instruction to computing and interpreting Cronbach Coefficient Alpha in SAS. Retrieved 2011, February 18, from http://www2.sas.com/proceedings/sugi26/p246-26.pdf

Yuen-Yee, G., & Watkins, D. (1994). Classroom environment and approaches to learning: An investigation of the actual and preferred perceptions of Hong Kong secondary school students. *Instructional Science, 22*(3), 233-246. doi: 10.1007/bf00892244

Zerihun, Z., Beishuizen, J., & Van Os, W. (2011). Conceptions and practices in teaching and learning: implications for the evaluation of teaching quality. *Quality in Higher Education, 17*(2), 151-161. doi: 10.1080/13538322.2011.582793

Zumwalt, K., & Craig, E. (2005). Teachers' characteristics: Research on the indicators of quality. In M. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 157-260). Washington, DC: American Educational Research Association. Retrieved