TAIWANESE SENIOR HIGH SCHOOL TEACHERS' MOTIVATION TOWARD TEACHING TASKS ACROSS SUBJECTS

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Abstract

This study is aimed to investigate Taiwanese senior high school teachers' motivation toward teaching tasks across different subjects. The focus is to examine whether there are differences in teacher motivation toward five teaching tasks: class preparation, teaching, evaluation of students, classroom management, and administrative tasks, across five subjects: Chinese, English, social studies, maths, and science.

A total of 283 practising teachers in 11 public senior high schools located in northern Taiwan completed a questionnaire adapted from the Work Tasks Motivation Scale for Teachers (Fernet et al., 2008). The collected quantitative data was analysed by computing descriptive statistics and inferential statistics which included two-way ANOVA. Thirty teachers were involved in the qualitative data collection using semi-structured interviews. The phenomenographic method was used to analyse the interview data, to uncover the qualitatively different ways in which teachers experience and conceptualise teaching and learning.

The findings from the quantitative analyses showed that, in general, teachers had a relatively high level of autonomous motivation and a moderately high level of controlled motivation toward the five teaching tasks. There were significant differences in (1) intrinsic motivation toward class management, (2) identified regulation toward class preparation, and (3) introjected regulation toward class preparation and teaching across the five subjects. No significant differences in external regulation and amotivation toward the five teaching tasks across five subjects were found. In contrast, there were significant differences in the five types of motivation (intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation) toward the five different teaching tasks across the five subject areas.

The findings from both the quantitative and qualitative analyses were integrated in order to answer research question 2: Are there differences in the five types of motivation toward teaching across five subjects? The results showed that: 1) teachers of Chinese, social studies, and English might have a tendency to have a higher level of introjected regulation toward teaching; 2) teachers of maths and science tended to have a lower level of introjected regulation toward teaching; 3) science teachers might have an inclination to have intrinsic motivation toward teaching; and 4) English teachers were apt to have external regulation toward teaching.

It is recommended that government policy makers, educational reformers, teacher education, school principals, administrators, and teachers should consider the potential influence of Chinese culture, the social and working context, subject areas, and teaching tasks on teachers' levels and types of motivation. They are suggested to consider the nuances of teachers' conceptions of teaching and learning across subjects when implementing educational reforms. Finally, the influence of Confucian culture on teachers' work motivation and conceptions of teaching and learning calls for more exploration, as this study only provides preliminary evidence on the existing work motivation and conceptions of teaching and learning held by teachers in Taiwan.

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Contents

List of Tables

List of Figures

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DECLARATION

This is to certify that none of the material offered in this thesis has previously been offered by me for a degree at the University of Durham or at any other institution.

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Chapter 1

Introduction

1.1 Introduction

When teaching in the senior high school, I heard my colleagues and teachers from other schools saying that they perceived pressure from an increasing workload and were, to some degree, lacking in pedagogical and subject-matter competence and procedural or organisational skills in the process of decision-making in school meetings concerning educational reforms. In addition, they felt that they were working in declining working conditions. Furthermore, these teachers perceived lack of respect from a change in social values.

It was apparent that school teachers felt increasingly inadequate in the face of rising expectations and greater responsibilities being placed on them, and thus they often complained that teaching was no longer like the past two decades when teachers were highly respected and students behaved well.

When I paid close attention to teachers in my school, it appeared that there were inconsistencies between what they said and did. That is, despite complaints, some teachers still did their best to help students solve problems and to care for their needs. Such phenomena aroused my interest to wonder whether these teachers' motivation had been greatly affected by the social, political, and educational changes in the past decades. Another phenomenon that attracted my attention was the seeming variations in teachers' attitudes toward teaching, classroom management, and administrative tasks across subjects in the face of social and educational changes.

For example, during small talks with my colleagues and teachers from other senior high schools, I learned that most Chinese and English teachers spent a great amount of time preparing their lessons even though they had taught Chinese and English for many years. They said that they felt anxious and uncomfortable if they did not prepare their lessons. In contrast, most maths and science teachers spent less time preparing lessons. Some maths teachers told me that it was not difficult for them to teach students maths because most students needed the whole period of time to solve one or two maths problems.

The same is true for classroom management. I noticed that teachers across subjects showed a different degree of concern for their students. Generally speaking,

most Chinese, English, and social studies teachers would go to the classroom to oversee students studying 'in the early period' (7:30 to 8:00 a.m. for self-study). If their students had learning or psychological problems, these teachers would try their best to get a whole picture of the situation and attempted to aid them. In so doing, some of the teachers ended up with exhaustion. They also said that if they did not keep a close eye on their students, they would feel worried and guilty.

In contrast, relatively few maths and science teachers would do this. Instead, they would give students general guidelines and let their students take responsibility for themselves in the hope of encouraging their independence. It appeared that teachers of maths and science tended to maintain an emotional distance from their students' problems and they seemed more relaxed than teachers of Chinese, English, and social studies.

Another stark difference between teachers across subjects in my school emerged in the past decade, during which educational reforms were implemented at all educational levels in Taiwan. When faced with educational reforms such as '95 Temporary Curriculum Guidelines', 'School-Based Curriculum', and 'Teacher Evaluation for Professional Development', teachers across disciplines had varied reactions to the administrative meetings regarding these educational reforms. Most teachers of Chinese and English tended to be indifferent to the meetings to some extent, and seldom aired their views as they thought these meetings were not pragmatic. In contrast to this, the majority of maths teachers were inclined to largely ignore the feelings of the principal and administrative staff. If they wanted to express their opinions in a meeting, they just did so without regard to what the principal and the administrative staff might think about them.

In opposition to teachers of Chinese, English, and maths, most social studies teachers appeared to be apt to express their opinions in the meetings and to be involved in school affairs. Some of them even liked to discuss some issues with the principal and administrative staff in private. Most science teachers seemed to be enthusiastic about school affairs and had a tendency to be administrative staff.

Because teachers are the driving force that determines whether educational reforms are successful, their motivation is a major issue concerning educational reforms in Taiwan today. A review of the literature shows that most studies about teacher motivation in Taiwan focus on teachers' self-efficacy and job satisfaction, and little attention is paid to teacher motivation in terms of self-determination theory.

Therefore, it is of great significance to investigate senior high school teachers' work motivation. This study is thus conducted to examine senior high school teachers' motivation toward teaching tasks and to explore whether there are differences in levels of motivation and types of motivations toward teaching tasks across subjects.

1.2 Context of the study

Over the last two decades, education in Taiwan has gone through dramatic changes due to political and social changes and globalisation. Before the mid-1980s, the government in Taiwan adopted a 'centralist' model to govern every aspect of society in order to preserve the cultural and national identity rooted in Mainland China (Husén & Postlethwaite, 1985; Knowles, 1978). Under this governance model, education, a primary means of social and ideological control, was tightly monitored by the government (Law, 1998). For example, the Ministry of Education (MOE) controlled the curriculum, the testing, the allocation of finance, the adoption of textbooks, and the procedure of student admission and graduation (Law, 1996a).

Under this educational system, all teachers across the nation were required to follow the national curriculum, use the official standard textbooks and teaching guides, and prepare their students for uniform entrance examinations such as the national testing which was based on those textbooks (Fwu & Wang, 2002; Lin, 1983). Despite the fact that such a centralised educational system might result in a lack of autonomy among teachers to develop their own curricular and instructional plans, it saved teachers the time and energy required to design appropriate materials and activities fit for their students, thereby making teaching a less stressful job. In addition, teachers were blessed with a secure career and a well-supported working environment (Fwu & Wang, 2002).

Moreover, according to Fwu and Wang (2002), during this period teachers in Taiwan enjoyed a relatively higher occupational prestige and greater satisfaction in their jobs than their international counterparts did. This was due to many favourable centralised policies concerning teacher recruitment and benefits as well as schooling operations. Furthermore, the higher social status that teachers had was another primary reason for job satisfaction. Studies showed that the public generally regarded teachers as role models who should lead a respectable life with good conduct at all times, and as learned scholars who were experts in their subject knowledge during this

period (Lin, 1980, 1992). Thus, the public held a 'morally and intellectually superior' image of teachers in Taiwan (Fwu & Wang, 2002).

In the late1980s, a grass-roots opposition movement rose up against the ruling party and forced the KMT to yield its political power. This revolution has transformed Taiwan from an authoritarian regime to a democracy with a multiple-party system that mirrors a pluralistic society (Chang, 1992; Tien & Chu, 1994; Tien, 1992). During the time of the revolution, governmental and non-governmental organisations were aware of the impact of the globalised economy and embraced the notion that national economic development, change, and success depend on a well-educated, highly literate, and numerate workforce. Accordingly, these organisations started to review and reform educational systems at different levels since the lifting of martial law in 1987, and hoped that with educational reforms, Taiwanese citizens would become more competitive in regional and world markets to adjust to widespread global, social, economic, and political changes in the twenty first century (Mok, 2000).

It follows, then, that in the early 1990s, the Executive Yuan officially set up the Council on Educational Reform (CER) of which Prof. Lee Yuen-Tseh, Nobel Laureate and President of Academia Sinica, was in charge. After a two-year intensive study of Taiwan's educational system, Prof. Lee published a Blueprint for Educational Reform in 1994, and the five-volume Consultation Papers in 1995 (Weng, 1999a). The following points are central to the Blueprint for Educational Reform: 1) deregulating the system, 2) attending to individual needs, 3) finding alternative routes for continuous education by establishing comprehensive high schools and a diversified admission system, 4) raising education quality by improving teachers' professional training, reinforcing education research assessment, using resources effectively, and developing diversified and specified technology education, and 5) establishing a lifelong learning society (CER, 1995; MOE of Taiwan, 1997a; Chung 1999; Weng, 1999b; cited in Mok, 2000, p. 642).

Then, the government implemented a policy of decentralisation and deregulation of education that led to changes in the national curriculum, the national testing system, textbooks, and teacher education, training, and evaluation. According to Poppleton (1999) and Poppleton et al. (1994), government policies on curriculum standards, school evaluation, teacher training, recruitment and retention have a significant impact on teachers' working conditions and levels of motivation and satisfaction and thus, indirectly, on their social status.

This is true for teachers in Taiwan today where teaching is more challenging, demanding, and stressful. For instance, the decentralisation, deregulation, and diversification of the national curriculum give schools and teachers a significant degree of autonomy and expect teachers to shift their roles from the traditional 'instructional technician' teaching, based on the one official textbook, to the 'curriculum designer' who selects materials from diverse sources (B. C. Chen, 1999; Ou & Yang, 1999). Nevertheless, many teachers are anxious, perplexed, and uncertain about such curriculum reforms due to a lack of clear standards and guidance, and inconsistent interpretations from the central government, schools, and teachers themselves (Pan, 2011).

The national testing system reforms such as a diversified admission system also bring about an increase in teachers' workload and stress. Unlike teachers who taught based on the one official textbook before the educational reform, teachers presently design activities and adjust their content and methods to fit their students' needs and levels in the hope that their students will perform well in the diversified admission system. In addition, the educational authorities today will allocate money for education according to the results of students' academic performance in the national testing. These unfavourable working conditions can undermine teachers' satisfaction with their jobs and reduce the desirability of teaching as career (Fwu & Wang, 2002).

Another large challenge for teachers is Teacher Evaluation for Professional Development (TEPD). TEPD has been experimentally implemented at primary and secondary school levels since 2000 in an attempt to improve and assure the quality of education by rewarding effective teachers and counselling ineffective teachers. TEPD, to borrow Dinham and Scott's (1998) phrase, is implemented "with little room for discretion on the part of principals and teachers and with little practical help from above" (p. 365). In addition, TEPD is a model based on Western culture and highlights teaching techniques and skills but neglects Taiwanese teachers who lead students by 'a role model and learned scholar' approach under the influences of the Confucian tradition, as argued by Yeh (2009). As a result, the majority of school-teachers are unwilling to accept Teacher Evaluation for Professional Development. Yet, despite teachers' passive resistance, educational authorities still try their utmost to persuade individual schools to participate in TEPD. This may be likely to directly influence teachers' behaviour or to decrease their motivation toward their own work

(Pelletier, et al., 2002).

Apart from the challenges of educational reforms, the status of teachers is declining in society. One reason for this is that the political transformation from authoritarianism to democracy and the cultural evolution from traditional conformity to modern pluralism in Taiwan have changed the image of the teacher in the eyes of the public and parents (Fwu & Wang, 2002). Teachers are no longer thought of as authoritative figures but rather as knowledge transmitters to prepare students for the national testing. Teaching is viewed as 'one occupation among many' in a pluralist society instead of 'a highly respected mission' in a traditional society (Fwu & Wang, 2002, p. 222).

Another reason is the media which often exaggerates bad news about teachers. It is not uncommon that teachers make news headlines for sexual harassment, wrong corporal discipline, and so on (Chen, 2010). For instance, at the end of August, 2010, an alleged teenaged murderer told a reporter that education in Taiwan did harm to him. Another piece of news reported that a teacher was sentenced to forty days in prison because he said that one of his students was 'the king of being late for the school'. These reports have a negative impact on the image of teachers in the public eyes. Consequently, some parents even ask their children to photograph teachers' 'wrong' behaviour in class as proof them for their accusations (Chen, 2010).

In short, the aforementioned changes are placing great pressure on teachers and giving them a sense of powerlessness and loss of dignity (Chen, 2010).

1.3 Purpose of the study

The purpose of the study is to investigate Taiwanese senior high school teachers' motivation toward work tasks from the perspective of self-determination theory. In addition, it endeavours to explore whether there are differences between teachers across subjects (Chinese, English, maths, science, and social studies) in regard to motivation toward teaching tasks. Finally, it attempts to examine whether there are differences between teaching tasks (class preparation, teaching, evaluation of students, classroom management, and administrative tasks) in regard to motivation of teachers across subjects.

1.4 Research questions

This study seeks to answer the following research questions:

Q1: What are the levels and types of motivation of Taiwanese senior high school teachers toward five teaching tasks across five subjects?

Q2: Are there differences between subject specialists in regard to teacher motivation toward teaching tasks?

Q3: Does teacher motivation differ according to particular professional tasks?

Q4: Is there an interaction between subject specialists and particular professional tasks in regard to teacher motivation?

Q5: How do conceptions of teaching shape teachers' tendency for certain type of motivation?

1.5 Hypotheses of the study

Given that there is no empirical study of teachers' motivation in terms of self-determination theory in Taiwan, this study will be initiated with the following hypotheses:

Ho1 Chinese, English, and social studies teachers will be more intrinsically motivated and have higher levels of identified regulation for 'Class Preparation' and 'Teaching' relative to maths and science teachers.

Ho2 Maths and science teachers will be more externally motivated for 'Class Preparation' and 'Teaching' relative to Chinese, English, and social Studies teachers.

Ho3 Chinese, English, and social Studies teachers will have higher levels of introjected regulation for 'Class Preparation' and 'Classroom Management' than maths and science teachers.

Ho4 'Class Preparation' and 'Teaching' will be far more intrinsically motivated than the other three types of tasks.

Ho5 'Class Preparation', 'Teaching', and "Classroom Management' will be experienced as more identified than the other two types of tasks.

Ho6 'Teaching' and 'Classroom Management' will be experienced as more introjected than the other three types of tasks.

Ho7 ‘Administrative Tasks’ will be far more externally motivated than the other four types of tasks.

1.6 Significance of the study

It is recognised that teacher motivation is crucially important for 1) educational leaders, because it is associated with student motivation and learning outcomes, 2) the advance of educational reforms, because motivated teachers are more willing to implement reforms, and 3) the satisfaction and fulfilment of teachers themselves (Jesus & Lens, 2005). However, recent studies have shown that elementary and high school teachers suffer from a greater lack of motivation than any other professional career in the Western context (Jesus & Lens, 2005).

A review of the literature reveals that educational psychologies have, over the last half-century or so, given their attention to the study of student motivation. However, there is little systematic and theory-driven research on teacher motivation (Richardson & Watt, 2010). In fact, few studies have researched teacher motivation, with the exception of research on teachers’ job satisfaction or self-efficacy (Hoy, 2008). Thus, in recent years, researchers have given attention to teacher motivation in Australia, the United States, and among many country members of the Organisation for Economic Cooperation and Development (OECD) (Watt & Richardson, 2008).

In contrast, a scarcity of research on teacher motivation, with the exception of research on teachers’ job satisfaction or self-efficacy, is undertaken in Taiwan. In fact, there is no research on teacher motivation toward teaching tasks among Taiwanese senior high school teachers from the perspective of self-determination theory. This study will thus contribute to a better understanding of the level and type of teacher motivation toward teaching tasks across subjects in Taiwan, and of whether there are differences in five types of motivation toward professional tasks between teachers across academic subject areas.

With a better understanding of Taiwanese senior high school teachers’ work motivation, suggestions can be offered to instructors to make them aware of their level and type of motivation when doing teaching tasks, thereby improving their quality of teaching and psychological well-being, and helping students to achieve better learning outcome. In addition, school principals and administrators can have a better idea of how to establish the preconditions for more autonomy in teachers’ work, which in turn can facilitate educational reforms.

Moreover, government policy makers and educational reformers can have a better understanding of disciplinary differences in teachers' motivation, and then take into account these differences when implementing educational reforms. Furthermore, teacher educators and trainers will have a clearer understanding of the characteristics of teachers of certain subjects, and design courses to enhance student teachers' autonomous motivation. Finally, this study can supply other researchers with a better knowledge of Taiwanese senior high school teachers' motivation toward teaching tasks across subjects. Hopefully, this will inspire further studies in this area.

1.7 Definition of terms

The terms used in this study are briefly defined (see Appendix 1).

Chapter 2

Literature Review: A Quantitative Study

Work motivation has developed a huge and complex collection of literature that is difficult to review given the limited space upon a study of the present nature. This chapter, however, will attempt to review relevant literature related to this study in the following sections:

i) Brief historical background of work motivation
ii) Studies of teacher motivation
iii) Self-determination theory (SDT)
iv) Disciplinary differences
v) Job characteristics

2.1 Brief historical background of work motivation

The initial work motivation in organisational research can be dated back to Taylor (1911) and his associates, who proposed an approach called scientific management, involving a "combination of job training, pay-for-performance incentive system, improving employee selection techniques, and job redesign" in order to manage workers (Steers et al., 2004, p. 380). Although this incentive-based approach contributes to people's performance at work, it seems cold and mechanic, and fails to treat workers as human beings (Bendix, 1956). This inhuman model of motivation is surely at odds with workers' beliefs about their reasons for working hard (e.g. Lawler, 1973). A particularly powerful critique of this pessimistic theory of motivation is given by McGregor (1960), who argues that work motivation is better underpinned by workers' self-generated drive to realise their own potential and better themselves (Haslam et al., 2000).

By the 1950s, several new models of work motivation emerged. These theories are referred to as content theories and aim to identify factors related to motivation. This line of research includes need theories (e.g., Alderfer, 1972; Maslow, 1954; Murray, 1938) and motivation-hygiene theory (Herzberg, 1966). Maslow's need-hierarchy theory describes human needs as a hierarchy of desires. These needs are categorised into five needs ranging from the basic, lower-order needs, such as the physiological needs, to higher-order needs for actualisation. Building on Maslow's need theory, Alderfer (1972) developed a model of three needs for existence,

relatedness, and growth. A second need theory of the same era, first introduced by Murray (1938), was fully developed by McClelland (1961, 1971) and focuses on the needs for achievement and power. In contrast to Maslow's abstract conceptualisation of needs, McClelland's conceptualisations are clearly related to workplace behaviour (Steers et al., 2004).

While Maslow and McClelland centre on the role of individual differences in motivation, Herzberg (1966; Herzberg et al., 1959) focuses on how the nature of one's job and work activities influence motivation and performance (Steers et al., 2004). In Herzberg's motivation-hygiene theory, work motivation is dependent on two factors: motivation and hygiene. The former involves advancement, achievement, recognition, and responsibility, whereas the latter refers to salary, fringe benefits, a good working environment, and good human relations. The motivators are parallel to the fourth and fifth levels of Maslow's needs hierarchy, and the hygiene factors are parallel to the first three levels of Maslow's needs hierarchy.

Along this line of research, Hackman and Oldham (1976) proposed their job characteristic theory, which puts work design, motivation, and job performance together. Hackman and Oldham (1980) advocated that the most effective way of motivating people in the workplace was through the optimal design of jobs. They proposed that job design such as providing variety, affording freedom and judgment to the employee, and offering meaningful performance feedback, can increase workers' internal motivation. Other researchers, such as Deci and Ryan, also advanced theories (e.g., self-determination theory) that focus on task-based intrinsic and extrinsic factors in motivation (Deci & Ryan, 2000; Deci, 1975).

Another strand of research on work motivation appeared in the mid-1960s, and focuses on the processes underlying work motivation. In sharp contrast with earlier content theorists regarding working environment as relatively static, process theorists think of working conditions as relatively dynamic. Therefore, they seek for causal relationships across time and events to account for human behaviour in the workplace (Steers et al., 2004). Cognitive theories of motivation are central to the process theory genre, of which expectancy or expectancy-valence theory is perhaps best-known. Derived from the work of Lewin (1938), and Tolman (1959), Vroom (1959) articulated a systematic expectancy theory which posits that employees tend to evaluate their behaviour and believe that their accomplishment will bring about valued outcomes.

In subsequent work, Porter and Lawler (1968) proposed a model of intrinsic and extrinsic work motivation on the basis of Vroom's (1964) expectancy-valence theory of motivation. This model assumes that both intrinsic and extrinsic rewards will yield total job satisfaction but these intrinsic and extrinsic rewards are additive. However, the additivity of intrinsic and extrinsic motivation is problematic and controversial (Gagne & Deci, 2005). For example, Deci (1971) concluded that verbal rewards enhanced intrinsic motivation whereas tangible extrinsic rewards undermined it. Later, Deci and Ryan (1980) proposed a cognitive evaluation theory - to explain the effects of extrinsic motivators on intrinsic motivation.

In addition to expectancy theory, several other important cognitive theories of work motivation have emerged since the 1960s, including equity theory, goal-setting theory, and social cognitive theory (Steers et al., 2004). Equity theory, introduced by Adams (1963), describes workers' response to perceived unfairness in the workplace. Specifically, how conditions of underpayment and overpayment influence employees' subsequent behaviour. Goal setting theory, proposed by Locke and Latham (1990), suggests that people's performance will be enhanced when they set specific, difficult goals with high valence. This theory involves motivation process which is related to both motivational direction and persistence. However, goal setting theory gives little attention to different goal contents and different types of goal pursuit, which result in different qualities of performance (Sheldon & Elliot, 1999; Sheldon et al., 2004).

Finally, Bandura (1977a, 1977b, 1997) proposed a social cognitive theory and self-efficacy theory, suggesting that people's beliefs in their capabilities to affect the environment can produce desired outcomes. Self-efficacy theory is supported by considerable research and is a major factor for determining work-related performance (Stajkovic & Luthans, 2003). Nevertheless, Baudura's self-efficacy is "a future-orientated judgment that has to do with perceptions of competence rather than actual levels of competence" (Hoy & Spero, 2005, p. 344). Namely, subjective perception of competence in self-efficacy beliefs is different from competence in self-determination theory, which is an innate desire to act on social environment (Deci & Ryan, 2000).

Over the past three decades, researchers of work motivation have extended and refined existing theories and conducted considerable empirical studies. Some theories are concerned with internalisation and identification with organisations, and others involve organisational commitment. Regarding internalisation and identification, Kelman (1958) proposed a theory of internalisation or attitude change

that focuses on identification with other people. Namely, a person's attitude-related behaviour can be changed either by identifying with others or by being congruent with one's values.

Contrary to Kelman's theory, Ellemers et al. (2004) presented a concept of identification in work motivation, focusing on identification with groups. This theory suggests that individuals' strong identification with a group facilitates their motivation and in turn enhances the group's performance. It is noteworthy that neither conception of identification that Kelman and Ellemers et al. proposed addresses whether this form of identification is autonomous or controlled (Ryan & Deci, 2002).

With respect to organisational commitment, building on Kelman's (1958) theory, O'Reilly and Chatman (1986) distinguished three kinds of organisational commitment: (1) identification with the organisation, (2) internalization with the organisation's values, and (3) compliance. In theory, O'Reilly and Chatman's (1986) identification and internalization are related to SDT's intrinsic motivation and introjected regulation, and their concept of compliance is similar to SDT's external regulation (Gagne & Deci, 2005). Allen and Meyer (1996) also presented three forms of commitment: affective, continuance, and normative commitment. Affective commitment describes an employee's emotional attachment to, identification with, and involvement in the organisation, and is the most aligned with SDT's autonomous motivation (Gagne & Deci, 2005).

More noteworthy is that, despite the different theoretical approaches used to understand work motivation in recent years, self-determination theory (SDT) perhaps receives more attention by researchers for two main reasons. One is that SDT bears a degree of similarity to need theories – a concept of psychological needs, i.e., the satisfaction of these needs are associated with more effective performance and well-being, albeit need theories mainly focus on the "energizers of motivation action" whereas SDT centres on "how behaviour is energized and how it is directed" (Gagne & Deci, 2005, p. 343). The other is that SDT focuses on the relative strength of autonomous versus controlled motivation, whereas other theories focus on the total amount of motivation (Deci & Ryan, 2008; Gagne & Deci, 2005).

2.2 Studies of teacher motivation

2.2.1 Teacher job satisfaction

2.2.1.1 Studies of teacher job satisfaction outside the context of Taiwan

A great number of studies explore teachers' job satisfaction based on the "two factor" theory that Herzberg (1966) proposed. Sergiovanni (1967) found that there were two factors contributing to the satisfaction and dissatisfaction of teachers. One was satisfiers, containing achievement, recognition, and responsibility. The other was dissatisfiers, involving interpersonal relations (students), interpersonal relations (peers), "supervision technical", school policy and administration, unfairness, status and personal life. Dinham (1992) also confirmed the "two factor" theory of teacher career satisfaction: intrinsic aspects of teaching, such as student achievement and teacher self-growth were found to be satisfying, whereas extrinsic factors like administrative responsibilities and poor interpersonal relations were found to be dissatisfying. Similarly, Oxman and Michelli (1980) revealed that intrinsic factors influenced job satisfaction and extrinsic factors led to job dissatisfaction.

Bishay (1996) reported that job satisfaction and motivation were significantly associated with responsibility levels, gender, subject, age, years of teaching experience and activity. To put it plainly, higher levels of responsibility and successful classroom discussions were the most important factors for job satisfaction. Regarding activities, teachers felt best when teaching in comparison with preparing classes, doing paperwork, and socialising with faculty members. In contrast, teachers felt bored during faculty meetings. With respect to subjects, mathematics and science teachers, in general, gave more positive responses than English and social studies teachers: mathematics and science teachers had significantly higher levels of enjoyment, challenge, skill, happiness, involvement, stimulation, and sociability than their humanities counterparts.

Dinham and Scott (1996a, 1996b, 1998) tested the 'two factor' theory of teacher career satisfaction in the Teacher 2000 project in Australia and proposed a three-domain model of teacher and school executive career satisfaction. They indicated that a third domain: school based factors – school leadership, climate and decision making, school reputation, and school infrastructure – were factors where most variations occurred from school to school. The results of this study reported that primary and secondary school teachers were most satisfied by matters intrinsic to the

role of teaching, including facilitating student achievement, helping students to modify their attitude and behaviour, positive relationships with students and others, feeling part of a collegial, supportive environment, and self-growth. In contrast to this, these school teachers were most dissatisfied with the extrinsic societally and systematically based factors like the status and image of teachers, increasing expectations of schools, and forcing educational changes.

Similar findings were found in Scott, Cox, and Dinham's (1998) study that concluded that English teachers in the UK were most satisfied with the core business of teaching and least satisfied with matters from systematic and societal levels. In contrast, Zembylas and Papanastasiou (2004) demonstrated that teachers in Cyprus were motivated to enter teaching by extrinsic rather than intrinsic motives: the higher the teachers' extrinsic motivation (the salary, the hours, and the holidays associated with this profession) was, the more satisfied the teachers were with their jobs.

Another strand of research on job satisfaction in recent years reports that there is a positive association between teacher job satisfaction and autonomy. Two studies, Crocco and Costigan (2007) and Pearson and Moomaw (2006), found that the degree of autonomy perceived by teachers was indicative of their job satisfaction. Similar findings were found in Crocoss and Costigan's (2007) study, in which teachers' desire for autonomy was significantly related to their desire to do good work. Likewise, a study with 563 Norwegian primary and middle school teachers showed that teacher autonomy was both directly and indirectly related to job satisfaction (Skaalvik & Skaalvik , 2009).

2.2.1.2 Studies of teacher job satisfaction inside the context of Taiwan

Several studies reported that elementary and secondary school teachers in Taiwan expressed relatively high degrees of satisfaction with their jobs (Chen, S. F. 1999; Xie, 1996; Zhuang, 1998). Similar to this, Fwu and Wang (2002) indicated that teachers in Taiwan enjoyed a relatively higher occupational prestige and an overall greater satisfaction with their jobs than their international counterparts. This may be because the Taiwanese government adopted favourable policies in teacher education and schooling operations over past decades.

2.2.2 Teacher efficacy

One line of research concerning teacher efficacy focuses on the link between

teacher efficacy and student outcomes in addition to teacher behaviour. Regarding student outcomes, a great number of studies indicated that teachers' sense of efficacy was linked with student outcomes, such as achievement (Ashton & Webb, 1986; Gibson & Dembo, 1984; Moore & Esselman, 1992; Ross, 1992), motivation (Midgley et al., 1989; Woolfolk & Hoy, 1990), and their students' own sense of efficacy (Anderson et al., 1988). However, Klassen et al. (2011) argue that there is a lack of evidence for such links because the predominance of teacher efficacy research focuses on the relationship of teacher efficacy with other within-teacher factors like teachers' job satisfaction or job stress.

With respect to teacher's behaviour, research has demonstrated that teacher efficacy is associated with teachers' attitudes toward using a wide variety of teaching materials and innovative teaching methods (Ghaith & Yaghi, 1997; Wertheim & Leyser, 2002), their enjoyment of teaching (Watters & Ginns, 1995), and their persistence and resilience in the face of setbacks (Gibson & Dembo, 1984). In addition, teachers with a higher sense of efficacy exhibit greater levels of planning and enthusiasm for teaching (Allinder, 1994; Guskey, 1984; Hall et al., 1992), have stronger commitment to teaching (Evans & Tribble, 1986; Coladarci, 1992), and use more positive behaviour management strategies (Emmer & Hickman, 1991; Saklofske et al., 1988; Woolfolk, 1990). Again, Klassen et al. (2011) point out that there is uncertain relevance of teacher efficacy research to educational practice. That is, how can teacher efficacy be made more relevant to practice?

Another strand of research regarding teacher efficacy centres on cultural influences. A number of studies indicate that the unique feature of cultures might affect the concept of teacher efficacy. For example, Lin and Gorrell (2001) revealed that the construct of teacher efficacy was subject to cultural and social influences concerning beliefs about the role of teachers: early childhood teachers in Taiwan were expected to take a major role in socialising children to fit into the existing social structure of school, while elementary pre-service teachers were expected to focus on children's academic learning . Likewise, Lin et al. (2002) found that pre-service teachers in Taiwan and the US had different expectations of teaching: for example, Taiwanese pre-service teachers expected more parental support than US pre-service teachers. Ho and Hau (2004) reported that guidance efficacy for Australian teachers were differentiable from discipline and instruction efficacy, whereas Hong Kong Chinese teachers exhibited an integrated personal efficacy pertaining to the areas of

discipline, instruction and guidance. They suggest that this may be because Chinese teachers tend to have the parent-like responsibility for guiding students' everyday behavior.

Klassen et al. (2011) argue that these studies offer context-specific judgments about specific teaching behaviours. On the other hand, they may not provide much theoretical useful information for teachers in broader domains. Klassen et al. further point out that the conclusion about cultural similarities and differences of the above-mention studies are built on speculation. They thus suggest that to unpack culturally based difference, researchers need to adopt research approaches associated with cultural or cross-cultural psychology.

Last but not least, despite an enormous amount of research on teacher efficacy, there are some other problems for teacher efficacy not mentioned above: measurement and conceptual problems (Klassen et al., 2011). For example, there was a lack of conceptual clarity in measuring the construct in Gibson and Dembo's (1984) Teacher Efficacy Scale, though some other researchers constructed other measures such as the Science Teaching Efficacy Beliefs Instrument (Riggs & Enochs, 1990), and the Teacher Sense of Efficacy Scale (Tschannen-Moran & Hoy, 2001).

2.2.3 Teacher motivation

In recent years, an increasing number of studies outside the Taiwanese context examining teacher motivation have shown that there is a close link between teacher motivation and student motivation and learning outcomes. For example, Pelletier et al. (2002) found that teacher motivation was associated with student motivation, i.e., highly motivated teachers provided greater autonomy support to their students. Bernaus et al. (2009) reported that teacher motivation was related to the teacher's use of motivating strategies, which in turn was related to student motivation and English achievement.

Similar findings were found in Guilloteaux and Dörnyei's (2008) survey, concluding that there was a clear relationship between South Korean teachers' motivational teaching practice and the language learning motivation of their classes. In Butler and Shibaz's (2008) and Butler's (2007) studies, the results revealed that teachers' achievement goals, patterns of communication, and behaviour in the classroom were linked with students' resultant learning and achievement outcomes. Likewise, a small number of studies showed that teachers who displayed high levels

of enthusiasm or intrinsic motivation to teach seemed to exert a positive effect on students' own motivation (e.g., Brigham et al., 1992; Kunter et al., 2008; McKinney et al., 1984; Patrick et al., 2000).

In contrast, there is a dearth of research on teacher motivation in Taiwan. Ke (2006) found that Taiwanese public high school teachers had higher levels of achievement motivation and displayed internal control.

2.3 Self-determination theory (SDT)

As SDT is the theory that underpins this study, the following describes the historical background, development, and theoretical framework of SDT.

The initial work of SDT, Cognitive Evaluation Theory, was traced back to the 1970s and then the "first relatively comprehensive statement" of SDT, i.e., Organismic Integration Theory, emerged in the mid-1980s (Deci & Ryan, 1985a). After that, studies on SDT mushroomed during the past decade (Deci & Ryan, 2008, p. 182). This is because SDT provides a framework to integrate discrepant viewpoints between humanistic theories of personality, psychoanalytic theories, and cognitive theories of development that employ an organismic meta-theory (Deci & Ryan, 2002) and operant behaviorists who assume that behavioural regulation and personality are a function of reinforcement histories and current contingencies (e.g., Skinner, 1953).

SDT embraces the notion that humans have natural, constructive tendencies to develop a coherent sense of self – a sense of wholeness, vitality, and integrity (Deci & Ryan, 2002, p. 5). SDT also postulates that there are clear and specifiable social-contextual conditions that facilitate versus forestall the processes of human nature (Deci & Ryan, 2000, 2002). To put it differently, the foundation of SDT rests on a dialectical view that concerns the interaction between an active, integrating organism and social contexts that either foster or hinder human nature (Deci & Ryan, 2000, 2002).

SDT is an approach to human motivation and personality development that highlights the significance of human beings' "evolved inner resources for personality development and behavioral self-regulation" (Ryan et al., 1997, p. 68). The basic assumption of SDT is that humans manifest active tendencies toward integration (Ryan, 1995), synthesis (Freud, 1962), organisation (Piaget, 1971), and self-actualisation (Patterson & Joseph, 2007) throughout their development (Deci & Ryan,

2008). In short, SDT addresses basic issues such as personality development, self-regulation, universal psychological needs, the impact of social environments on motivation, behaviour, and well-being (Deci & Ryan, 2008).

Over the past three decades, SDT developed into a multifaceted theory composed of mini-theories, including Cognitive Evaluation Theory, Organismic Integration Theory, and Basic Needs Theory (Deci & Ryan, 2002). The three mini-theories will be introduced in the following sections, respectively.

2.3.1 Intrinsic and extrinsic motivation

This section discusses the differentiation of motivation within the SDT tradition which began with the distinction between intrinsic motivation, extrinsic motivation, and amotivation (Deci & Ryan, 1985a).

2.3.1.1 Intrinsic motivation

Intrinsic motivation involves doing certain activity because that activity itself is interesting and satisfying (e.g., Deci, 1975; Deci & Ryan, 2008). When intrinsically motivated, people perform activities because they enjoy it, are interested in what they are doing, are curious about novel stimuli, and try to explore and master optimal challenges (Deci, 1975; White, 1959).

Intrinsic motivation occurs in the relationship between individuals and activities. Therefore, to understand intrinsic motivation, one must think how activities are experienced by the individual and how these experiences are influenced by situational and contextual factors (Ryan et al., 2009, p. 110).

Within the larger framework of SDT, Cognitive Evaluation Theory (CET) – initial mini-theory in the area of SDT – that expanded upon De Charms' (1968) analysis of perceived locus of causality – was formulated to describe the effects of social contexts on people's intrinsic motivation (Deci & Ryan, 1980; Deci, 1975). CET suggests that social and contextual factors can facilitate or undermine intrinsic motivation by supporting or thwarting people's inherent psychological needs, including needs for autonomy, competence, and relatedness (Deci & Ryan, 2000).

CET first argues that feelings of autonomy enhance intrinsic motivation. This is supported by a number of studies. For example, internal factors – providing choice that prompts a shift in the perceived locus of causality (PLOC) from external to internal (De Charms, 1968; Heider, 1958) – enhance feelings of autonomy and

increase intrinsic motivation (Zuckerman et al., 1978). In contrast, external factors – tangible rewards, deadlines (Amabile et al., 1976), surveillance (Lepper & Greene, 1975), and evaluations (Smith, 1975) that tend to prompt a change in PLOC from internal to external – decrease feelings of autonomy and diminish intrinsic motivation.

CET further suggests that feelings of competence are also important for intrinsic motivation, and is confirmed by some studies. For instance, when provided with optimally challenging activities, individuals are highly intrinsically motivated (e.g., Danner & Lonky, 1981). Positive feedback that promotes a sense of competence is found to enhance intrinsic motivation (e.g., Deci, 1971; Fisher, 1978; Ryan, 1982). Conversely, negative feedback that decreases perceived competence diminishes both intrinsic and extrinsic motivation, leaving people amotivated (Deci & Ryan, 1985a).

CET specifies that feelings of competence do not maintain or enhance intrinsic motivation unless they are located in the context of autonomy. This is in contrast to social-learning theory approaches (e.g. Bandura, 1989). Hence, CET maintains that feelings of both competence and autonomy are essential for intrinsically motivated behaviour.

With regard to relatedness, there is not much evidence that it is related to intrinsic motivation. Nevertheless, Deci and Ryan (2000) posit that in the facilitation of intrinsic motivation, relatedness plays a more distal role than autonomy and competence do. For instance, an interpersonal climate that makes people feel supported enhances intrinsic motivation. In contrast, an interpersonal climate that makes people feel controlled undermines intrinsic motivation (Deci et al., 1989; Vansteenkiste et al., 2004).

Briefly, CET focuses on the determinants of intrinsic motivation: the effects of social-contextual factors on intrinsically motivated behaviour. However, CET is not feasible in work organisation because it neglects the fact that most people work to earn money, and many tasks in work organisations are not intrinsically interesting (Gagne & Deci, 2005). It seems to be practical and appealing to use incentives to motivate employees to work harder and perform better (Gagne & Deci, 2005). The critiques of CET are addressed by the concept of internalisation which differentiates extrinsic motivation, as presented by Ryan, Connell, and Deci (1985).

2.3.1.2 Extrinsic motivation

Extrinsic motivation is defined as an engagement in activities because they lead

to separate outcomes from the activity itself (e.g., Deci, 1975; Deci & Ryan, 2008). When extrinsically motivated, people do activities because they want to obtain a tangible reward or to avoid punishment (Deci, 1975; White, 1959).

While intrinsic motivation is spoken of in a relatively unified way, extrinsic motivation is a much more complicated category of motivation (Ryan et al., 2009). That is, SDT contains a differentiated taxonomy of the various forms of regulations underlying extrinsic motivation (Ryan & Connell, 1989). These different extrinsic motivations are described with a second sub-theory of SDT: Organismic Integration Theory (OIT; see Deci & Ryan, 1985a, 2000).

Organismic Integration Theory, introduced by Deci and Ryan in 1985, assumes that human development is a process of internalising, elaborating, and integrating inner representations of oneself into one's social world. OIT was formulated to explain the developments and dynamics of extrinsic motivation, i.e., extrinsically motivated behaviours can become self-determined through the process of internalisation and integration (Deci & Ryan, 1985a; Ryan & Connell, 1989; Deci & Ryan, 2000). Internalisation and integration rely on the degree to which people experience surrounding support for the satisfaction of basic psychological needs (Deci & Ryan, 2008).

OIT specifies that a continuum of autonomy underpins extrinsic motivation, i.e., different forms of extrinsic motivation vary in their relative autonomy (Ryan et al., 2009; Deci & Ryan, 2002). At the controlled or non-autonomous end of this continuum is external regulation in which people's behaviour is driven by externally controlled rewards or punishments. It has an externally perceived locus of causality (De Charms, 1968). Next to this continuum is introjected regulation, in which people engage in certain behaviours to feel better about their self-worth or to avoid self-esteem blows or self-disapproval. It is partially internalised but not truly accepted as one's own (Deci & Ryan, 1995). Another more internalized and autonomous on this continuum is identified regulation in which people identify with a value. It involves an acceptance of the behaviours as personally important and has a relatively internal perceived locus of causality. When identifications are synthesised and coordinated with a person's other values, regulation is described as integrated. Integrated regulation is fully integrated into one's self, and has a high degree of autonomy.

OIT thus proposes that perceptions of autonomy play an extremely critical part in the process of internalisation. When people experience a sense of volition and choice

from external demand, they grasp the meaning of activities, integrate that meaning with other goals and values, and further transform values into their own. Namely, support for autonomy is the basis for people to internalise extrinsically motivated behaviours into the integrated self (Deci & Ryan, 2002).

In addition to feelings of autonomy, OIT proposes that the need for relatedness to others is crucial for internalisation. Because extrinsically motivated behaviours are uninteresting, they need to be promoted or valued by significant others. This suggests that support for feelings of relatedness is centrally important for promoting internalisation. However, relatedness alone is not enough to fully internalise extrinsically motivated behaviours. People need to feel competent regarding behaviours valued by a significant other. Accordingly, OIT suggests that support for competence fosters internalisation and the subsequent self-regulation (Vallerand, 1997).

Briefly, these three types of internalised extrinsic regulation – introjection, identification, and integration – align with external regulation, and fall on a continuum of relative autonomy or self-determination (Deci & Ryan, 2002).

2.3.1.3 Autonomous motivation, controlled motivation, and amotivation

The concept of internalisation and the types of regulation have changed the differentiation "from a focus on intrinsic vs. extrinsic motivation to a focus on autonomous vs. controlled motivation" within SDT (Deci & Ryan, 2008, p. 16). Identified, integrated, and intrinsic regulations are forms of autonomous motivation whereas external and introjected regulations are forms of controlled motivation. In contrast to motivation, amotivation is defined as the lack of intention to act. Amotivation results from a person perceiving themself to be unable to achieve intended outcomes, not valuing a behaviour or outcome, or believing that a valued outcome is not connected with specific behaviour (Deci & Ryan, 1985a; Deci & Ryan, 2008).

Figure 2.1 shows a graphic representation of amotivation, extrinsic motivation, and intrinsic motivation, along the continuum of relative self-determination (Deci & Ryan, 2008, p. 17).

Figure 2.1. Types of Motivation and Regulation within Self-Determination Theory

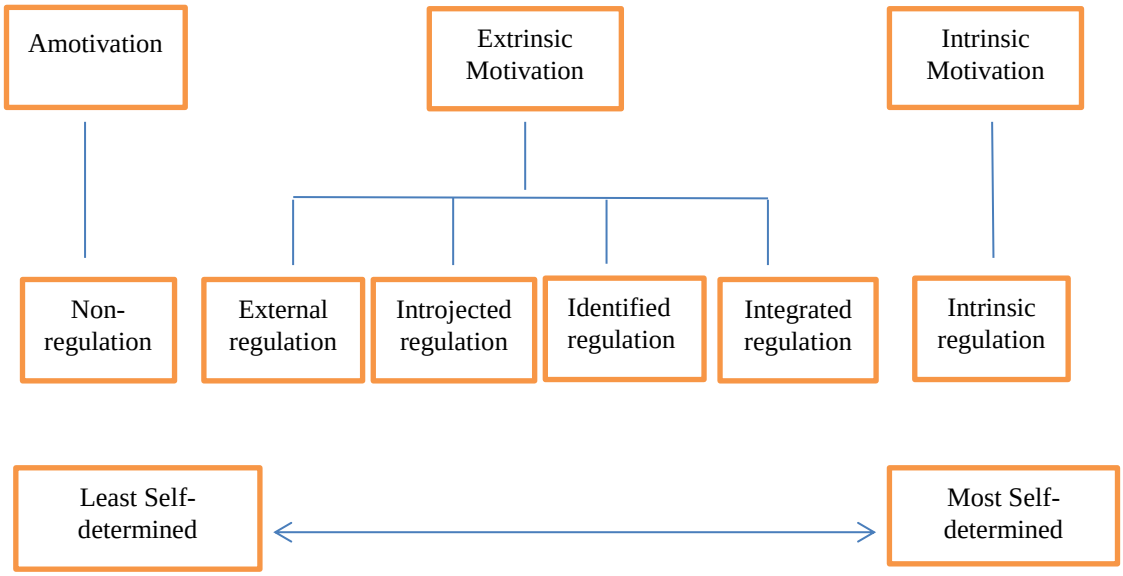


Figure 2.1 The types of motivation and regulation within self-determination theory, along with their placement on the continuum of relative self-determination. Adapted from "Facilitating Optimal Motivation and Psychological Well-Being Across Life's Domains" by E. L. Deci and R. M. Ryan, 2008. *Canadian Psychology, 49,* p. 17. Copyright 2008 by the Canadian Psychological Association.

2.3.2 Facilitating motivation

A basic tenet of SDT is that in order to be optimally motivated, and to experience well-being, people have to experience certain essential psychological needs in their activities (Ryan et al., 2009). In a third sub-theory called basic psychological needs theory, SDT postulates that there are three basic and universal psychological needs – the needs for competence, autonomy, and relatedness – that serve as supports for motivation and well-being (Deci & Ryan, 2000; Ryan, 1995).

These basic psychological needs represent innate nutriments from the social environment that are essential to the process of integrity and well-being in all developmental periods and cultures (Deci & Ryan, 2000, 2002). Social-contextual conditions supportive of the basic psychological needs promote internalisation and integration (Deci & Ryan, 2008). Specifically, when satisfied within social

environments, the basic psychological needs promote internalisation, integration, adaptation, and directly impact well-being. In contrast, social contexts that impede the satisfaction of the basic psychological needs provoke ill-being or other psychological problems (Deci & Ryan, 2002; Ryan, 2005; Ryan et al., 2006). In other words, the concept of basic psychological needs intends to convey that there are certain necessary psychological supports required for motivation and wellness (Deci & Ryan, 2000; Ryan, 1995).

It is important to note that needs in SDT are different from needs in drive and personality theories. Needs in SDT are understood as psychological rather than physiological, whereas needs in drive theories are defined at the physiological level as innate and organismic necessities (Deci & Ryan, 2000). The concept of needs in SDT is regarded as innate and universal (e.g., Kohut, 1977; Maslow, 1943), while needs in personality theories are viewed as learned and differ in strength (e.g., McClelland, 1985; Murray, 1938).

The three basic psychological needs – competence, autonomy and relatedness – are described as follows.

2.3.2.1 The need for competence

The need for competence is dated back to White's (1959) approach to personality and development. White posits that the individual has an innate, universal propensity for competence that affects the environment, and is called 'effectance motivation' (White, 1959). The ultimate goal of effectance-motivated behaviour is to develop the organism's capabilities for survival.

In addition, White also introduces two other constructs – competence and sense of competence – that are a product of learning (Elliot et al., 2002, cited in Deci & Ryan, 2002). Competence is defined as people's actual skills and abilities to interact effectively with the environment (White, 1963). Sense of competence described people's subjective perception of their own skills and abilities to interact effectively with the environment, which is similar to Bandura's (1986) self-efficacy (Elliot et al., 2002, cited in Deci & Ryan, 2002).

Consistent with White's assumption, SDT postulates that humans possess an innate form of competence motivation to act on their environment (Deci & Ryan, 2002). However, instead of defining the need for competence construct as an innate desire for effectance *per se*, SDT defines it as an innate desire for competence (Elliot

et al., 2002, cited in Deci & Ryan, 2002). In short, SDT posits that the need for competence is an innate tendency in nature and has a powerful and widespread influence on personality functioning and psychological well-being (Deci & Ryan, 2000, 2002).

2.3.2.2The need for autonomy

Autonomy refers to an organism's perceived origin or source of behavior (De Charms, 1968; Deci & Ryan, 1985b; Ryan & Connell, 1989). Autonomy concerns experiences of volition and regulation by the self. That is, autonomy pertains to actions based on one's integrated values or interests (Chirkov & Ryan, 2001). When autonomous, people experience their behaviour as self-organised and endorsed.

Autonomy is often incorrectly equated with the concept of independence but autonomy is not the same as independence (Ryan & Lynch, 1989). Independence refers to freedom from the governance of others, whereas autonomy refers to freedom to self-govern and involves a choice based on an awareness of one's own needs and values (Hodgins et al., 1996).

People are either autonomous or controlled in their relative dependence and they are either autonomous or controlled in their relative independence (Soenens et al., 2007). For example, some studies distinguish independence from autonomy and suggest that non-reliance on others is related to maladjustment, whereas autonomous self-governance is associated with a more positive adjustment (Hoffman, 1984; Ryan & Lynch, 1989).

Likewise, Koestner and Losier (1996) distinguish between reactive and reflective autonomy. Reactive autonomy is defined as the tendency to act independently without affecting from others, whereas reflective autonomy is the inclination to experience a sense of choice. Studies suggest that reflective autonomy is more likely to be linked with positive mood, adaptive behaviour, and effective social functioning than reactive autonomy (William & Koestner, 1993). The concept of reflective autonomy is similar to autonomy in SDT, which claims that individuals experience reflective self-determination about their behaviour (Hodgins et al., 1996).

2.3.2.3The need for relatedness

Relatedness refers to the desire to feel connected to, to care for, and to be cared for by others (Baumeister & Leary, 1995; Bowlby, 1969; Ryan, 1995; Deci & Ryan, 2000). It reflects that individuals tend to connect with, to be integral to, and to be

accepted by others, i.e., to have a sense of belongingness both to other individuals and to groups. Baumeister and Leary (1995) argue that relatedness is a fundamental need that is central to attachment theories (Ainsworth et al., 1978). This integrative tendency is concerned with the psychological sense of being with others rather than with a formal status or a certain outcome (Baumeister & Leary, 1995).

To sum up, all three needs play a role in the internalisation process as specified within OIT. Therefore, it is essential to provide psychological support for the person's motivation and wellness (Ryan et al., 2009).

2.3.3 Studies of autonomy support

Autonomy support involves the attitude and practises of one individual or a broader social context that fosters the target individual's self-organization and self-regulation of actions and experiences (Deci & Ryan, 2008; Ryan & Deci, 2000; Ryan & Deci, 2008), and is promoted by acknowledging the target individual's perspective (Koestner et al., 1984), supporting a sense of choice (Moller et al., 2006), offering individuals with unconditional regards (Assor et al., 2004), providing a meaningful rationale for requests (Deci et al., 1994), and minimizing pressure and control (Ryan, 1982).

An enormous amount of research shows that teachers' autonomy support leads to self-determined forms of motivation (e.g., for reviews, see Deci & Ryan, 2000; Reeve, 2002; Vallerand, 1997). When supported autonomously, individuals often think the importance of social values and norms to themselves and often feel free to follow their interest (Deci & Ryan, 2008). Given that considerable research concerning autonomy support has been carried out across various domains, the following sections only focus on studies concerning autonomy support in education and the workplace related to this study.

2.3.3.1 Studies of autonomy support in education and the workplace outside the context of Taiwan

2.3.3.1.1 Autonomy support in education

A substantial body of research has examined factors affecting the interpersonal climate of a classroom that tends to be autonomy-supportive or autonomy-controlling. These factors include the orientation of the teacher, teacher autonomy support, and

teacher autonomy-supportive vs. controlling communication style. With regard to the orientation of the teacher, Deci et al. (1981) found that when teachers were more autonomy-supportive, students were more intrinsically motivated, felt more competent at the schoolwork, and had higher self-esteem than the students of more control-oriented teachers.

Concerning teacher autonomy support, Reeve et al. (1999) observed that pre- and in-service teachers who supported their students' autonomy showed distinctive autonomy-supportive style and attempted to support students' intrinsic motivation and autonomous self-regulation. Similar to this, Chirkov and Ryan (2001) reported that teacher autonomy support in both Russia and the United States was associated with high school students' intrinsic motivation and identification with school-related goals. In the same vein, Reeve (2002, 2006) revealed that teachers who were autonomy-supportive fostered students' autonomous motivation.

Consistent with previous studies, multiple further studies prove the importance of autonomy support in medical schools (Williams & Deci, 1998). For instance, Williams et al. (1997) showed that perceived autonomy support of preceptors predicted students choice of internal medicine or surgery. Similarly, Williams and Deci (1996a) found that medical students who were exposed to an autonomy-supportive instructor had stronger feelings of autonomy. Likewise, Sheldon and Krieger (2007) reported that the students in a law school who experienced more autonomy support from the faculty were more likely to pass the bar exam, and showed less declines in basic psychological need satisfaction, which in turn predicted better well-being than those students who experienced less autonomy support.

Similar findings are also demonstrated in physical education and sport. Hagger et al. (2003) found that physical teachers' autonomy support in their classroom predicted students' autonomous motivation for leisure-time physical activity, thereby predicting their actual physical activity outside the school context. Pelletier et al. (2001) assessed elite Canadian swimmers' perceptions of their coaches' autonomy support, and indicated that swimmers who perceived autonomy support from their coaches exhibited more self-determined forms of regulation, i.e., intrinsic and identified motivation, for swimming.

As for teacher autonomy-supportive/controlling teaching style, several studies indicate that when teachers adopt an autonomy-supportive teaching style, it leads to students' autonomous internalisation of learning activities at different educational

levels, including elementary (Ryan & Grolnick, 1986), secondary (Trouilloud et al., 2006) and college/university levels (Williams & Deci, 1996). Likewise, Vansteenkiste et al. (2004) showed that teachers' autonomy-supportive style resulted in high school and college students' greater learning and performance outcomes than teachers with autonomy-controlling style did.

In brief, the above studies demonstrate that teacher autonomy support is associated with students' autonomous motivation and results in greater learning outcomes.

2.3.3.1.2 Autonomy support in the workplace

A number of studies demonstrate that autonomy support is positively related to employees' job performance and psychological well-being in workplaces and organisations. Deci et al. (1989) found that the interpersonal orientations of managers of a Fortune company were related to the perceptions, affects, and satisfactions of employees. Baard et al. (2004) revealed that in banking companies, managers who were more autonomy supportive had employees who experienced greater basic psychological need satisfaction, had higher performance ratings, and evidenced greater well-being than employees whose managers were more controlling.

Likewise, Deci et al. (2001) showed that in a former Easter Bloc country, when employees' supervisors were autonomy supportive, employees experienced need satisfaction, which in turn predicted both task engagement and psychological well-being in addition to experiencing less pressure. Lynch et al. (2005) found that clinic staff who experienced more autonomy support reported greater well-being at work, more intrinsic job satisfaction, and greater internalisation of the treatment programme. They also had a less controlling attitude toward their patients.

Again, these studies in workplaces and organizations underscore the notion that providing support for employees' basic psychological needs enhances their performance and promotes their adjustment, persistence, and creativity (Deci & Ryan, 2008).

2.3.3.2 Studies of autonomy support in education and the workplace inside the context of Taiwan

Several recent studies at different educational levels show that Taiwanese teachers' autonomy support has a great influence on their students' autonomous

motivation (e.g., d' Ailly, 2003; Hardré et al., 2006; Lin, 2010; Shih, 2008).

For example, d'Ailly (2003) found that elementary teachers' autonomy support as well as maternal involvement were important for children's autonomy. Specifically, a child's perceived level of autonomy support from their teachers had a significant effect on their motivation orientations. Shih (2008) showed that Taiwanese junior high school students who perceived a higher level of autonomy support from their teachers reported more emotional engagement, and predicted intrinsic motivation, identified regulation, and introjected regulation, but not external regulation. Similar findings were found in Lin's (2010) study which showed that teacher autonomy support was significantly related to Taiwanese junior high school students' behavioural and emotional engagement.

Consistent with previous studies, Hardré et al. (2006) reported that high school students who perceived their teachers' autonomy support were more engaged in class and worked harder. More importantly, teachers were much more influential than peers on the motivation of these students. Likewise, Lin (2009) showed that university students' perceived autonomy support had contextual effects on their autonomy, competence, and motivation in physical class. Briefly, all these studies suggest that an autonomy-supportive learning environment plays a critical role in fostering optimal academic functioning.

Again, like studies conducted outside Taiwanese contexts, a study by Do (2008), investigating Taiwanese employees' work motivation, revealed that managerial autonomy supports had a significant effect on promoting employees' job outcomes.

In short, research shows that autonomy support from teachers has a great influence on students' autonomous motivation. Thus, the importance of autonomy-supportive teachers cannot be overstated (Deci & Ryan, 2008).

2.3.4 Studies of autonomous motivation and controlled motivation

According to Deci and Ryan (1985), autonomous motivation enables people to realise their true self, whereas controlled motivation is experienced from internal or external pressure. Deci and Ryan (2002) further assert that both autonomous and controlled forms of motivation are capable of regulating behaviours. However, behavioral engagement for self-determined motives is associated with both sustained behaviour and good mental health, whereas engagement that is aligned with controlled motives is linked with highly contingent self-worth and poor mental health.

In other words, SDT assumes that autonomous motivation is closely connected to well-being and personal accomplishment.

Previous studies in a variety of domains show that greater autonomous motivation is related to more adaptive functioning (Koestner & Losier, 2003). Specifically, autonomous motivation is related to active information seeking (Koestner et al., 1996), positive emotions (Koestner & Losier, 2003), resilience in the face of setbacks (Koestner & Zuckerman, 1994), effective interpersonal functioning (Koestner & Losier, 1996), and better academic performance (Burton et al., 2006). The following section addresses studies of autonomous motivation and controlled motivation for the purpose of teaching.

2.3.4.1 Studies of autonomous motivation and controlled motivation outside the context of Taiwan

There is a huge body of research concerning teachers' orientations toward autonomy and autonomy-supportive teaching (e.g., Deci et al. 1981; Reeve, 2002; Reeve et al., 1999; Vallerand et al., 1997). However, only a small amount of research addresses autonomous motivation for teaching (Roth et al., 2007). Autonomous motivation for teaching refers to "teacher's thoughts and feelings regarding their own motivations for engaging in teaching", whereas autonomy-supportive teaching refers to "teacher's preferred and actual teaching styles" (Roth et al., 2007, p. 761). Despite such differences, autonomous motivation for teaching enhances autonomy-supportive teaching, which in turn leads to autonomous motivation for learning among students (Roth et al., 2007).

According to Roth et al. (2007, p. 764), autonomous motivation for teaching was hypothesised to enhance autonomy-supportive teaching by a number of different processes. The first process involves autonomously motivated teachers' understanding of teaching. Autonomously motivated teachers tend to have a deep understanding of the values of the subjects they teach. Second, they use a variety of methods to lead their students to master the subjects. Third, they offer students convincing explanations for the value and relevance of those subjects and for their methods of teaching. Fourth, based on their deep understanding of those subjects, teachers comprehend that there are many facets to those subjects and many ways to learn them, which leads them to provide choice for their students.

The second process is concerned with autonomously motivated teachers'

personal experiences and understanding of autonomous motivation and its benefits. They prefer that their students learn and act from autonomous motivation, which leads to a high quality of learning and a greater appreciation of the subjects they study by presenting autonomy-supportive actions. The third process assumes that autonomously motivated teachers have a greater resilience to the pressures of achievement and impression formation, and so invest more time and efforts in activities of high-quality learning.

Few studies examine how teachers' motivation directly affects their teaching behaviour from students' standpoint. For example, Garbarino (1975) showed that rewarded teachers were more critical and demanding of their students than volunteer teachers, and thus students who were taught by rewarded teachers made more errors when learning a skill. Similar to this, Wild et al. (1997, study 2) observed that participants who were taught a skill by extrinsically motivated teachers reported a lower interest in learning and lower task enjoyment than those taught by intrinsically motivated teachers. Wild et al. (1992) found that students perceived an intrinsically motivated teacher (volunteer teaching) to exhibit greater enjoyment, enthusiasm, and innovation than an extrinsically motivated teacher (paid teaching). Further, students in a volunteer teaching group also enjoyed lessons more, had a more positive mood, and were more interested in further learning.

A number of studies on teacher motivation from the perspective of SDT have been undertaken from teachers' self-report in recent years. For example, a study by Pelletier et al. (2002) was the first one from teachers' self-report to explore correlations of autonomous motivation for teaching. As expected, teachers' self-determined motivation toward their work predicted their disposition to be autonomy-supportive with students. In addition, the more teachers perceived pressure from above (e.g., they had to comply with a curriculum or performance standard) and pressure from below (e.g., they perceived their students to be non-self-determined), the less they were self-determined toward teaching, which led them to become more controlling with students. On the contrary, when teachers were more supportive of autonomy and less controlling, students demonstrated higher levels of intrinsic motivation and self-determination.

Another study, examining teachers' experience of autonomous motivation for teaching and its association between teachers and students, found that autonomous

motivation for teaching was predicted to be related positively to teachers' sense of personal accomplishment and negatively to their emotional exhaustion (Roth et al., 2007). More importantly, the result reported that teachers' self-reported autonomous motivation for teaching was expected to enhance students' self-reported autonomous motivation for learning. In short, these school studies suggest that, for teachers, self-determined motivation facilitates an autonomy-supportive socialisation style, and thereby promotes positive outcomes for students. Contrarily, experiences of pressure and emotional exhaustion diminish autonomy support (Joussemet et al., 2008).

Fernet et al. (2008) examined teacher motivation toward various teaching tasks and revealed that elementary teachers in Quebec displayed higher levels of amotivation toward class preparation than high school teachers. However, high school teachers presented higher levels of external regulation toward class management than elementary school teachers. Also, women had higher levels of identified regulation than men toward class preparation and administrative tasks. With regard to intrinsic motivation to teaching, results showed that, male elementary teachers had lower levels of intrinsic motivation toward teaching than male high school teachers. Nevertheless, no difference was observed for intrinsic motivation toward teaching between female elementary and high school teachers.

With respect to identified regulation toward teaching, results indicated that male elementary teachers had lower levels of identified regulation than male high school teachers. In contrast, female elementary teachers presented higher levels of identified regulation toward teaching than female high school teachers. As for amotivation toward teaching, results revealed that female high school teachers had higher levels of amotivation than female elementary teachers. However, no difference was observed between male high school teachers and male elementary school teachers.

Carson and Chase (2009) revealed that physical education teachers' perceptions of teacher autonomy, competence, and relatedness were positively and strongly associated with self-determined motivation. More specifically, perceptions of autonomy, competence, and relatedness were most closely aligned with intrinsic motivation and professional behaviour.

In short, the above research shows that teachers' autonomous motivation is, in some fashion, related to students' autonomous motivation.

2.3.4.2 Studies of autonomous motivation/ controlled motivation in the context of Taiwan

There are no studies conducted in the area of teachers' autonomous/controlled motivation in Taiwan.

2.4 Disciplinary differences

The following sections review extant literature on disciplinary differences related to this study in terms of 1) epistemological characteristics and knowledge structures, 2) concepts of teaching, 3) the nature of teaching, 4) teaching approaches, and 5) group characteristics of teachers.

2.4.1 Epistemological characteristics and knowledge structures

A large body of research about disciplinary differences at university level has been conducted over the past few decades (e.g., Becher, 1994; Biglan, 1973; Healey, 2000; Kolb, 1981; Moses, 1990; Neumann & Becher, 2002; Smeby, 1996). Some studies focus on the disciplinary differences in epistemological characteristics and knowledge structures. For example, Biglan (1973) categorised disciplinary differences into six groups on the basis of their concern with (1) a single paradigm (hard vs. soft), (2) application (pure vs. applied), and (3) life system (life system vs. nonlife system). Becher (1989) modified Biglan's (1973) six-fold classification of disciplines and identified four categories: 'pure hard', 'pure soft', 'applied hard', and 'applied soft'. 'Pure hard' areas refer to natural sciences, 'pure soft' areas involve humanities and social sciences, 'hard applied' areas refer to science-based professions, and 'soft applied' involve social professions (Becher, 1994).

Further, Neumann and Becher (2002) briefly summarised previous studies and stated that 'pure hard' knowledge can be referred to as cumulative and atomistic in nature, concerned with universals, able to simplified, and quantitative in emphasis. Communities of knowledge are competitive but gregarious, and teaching content in the curriculum is linear and hierarchical. The development of disciplinary understanding relies on established facts and demonstrable theories. Instructional methods emphasise instructions, i.e., the teacher informs the student via mass lectures and problem-based seminars. Student learning focuses on fact retention and the ability to solve logically structured problems.

'Pure soft' knowledge can be described as holistic and qualitative in nature, concerned with particulars, and having a qualitative bias. Knowledge communities tend to be a solitary pursuit and only have a limited overlap of interest between researchers. Teaching content is spiral in curricula configuration and more free-ranging and qualitative, and teaching methods stress a formative process of knowledge-building and contain more face-to-face class meetings and tutorial teaching. Teaching activities are largely constructive and interpretative. Student learning emphasises creativity in thinking and fluency of expression.

Hard applied knowledge denotes the mastery of the physical environment and is concerned with products and techniques. Soft applied knowledge is concerned with the enhancement of professional practice and seeks to produce protocols and procedures. Applied knowledge communities are also gregarious, displaying interactions with both their teaching and research activities (Biglan, 1973b).

2.4.2 Concepts of teaching

A great number of studies have been undertaken at tertiary level to investigate disciplinary differences in educational beliefs. For example, Quinlan (1997) found that two university teachers held different perspectives in teaching history: one regarded history as a process of interpreting facts, and the other viewed history as the story of people's lives. Such different beliefs affected their teaching goals and styles. Lenze (1995) reported that two core disciplinary concepts of four Spanish and linguistics teachers were quite different: the core concepts in Spanish were production – teachers taught students to produce and engage in a long-term relationship with Spanish. In contrast, the core concepts in linguistics were argumentation – teachers wanted to get students to argue, think analytically, and see things from a linguist's perspective. These two different concepts influenced much of their knowledge, thinking, discussion, and actions concerning teaching.

Hativa (1995), examining undergraduate lecturers in a hard pure (physics) discipline and a hard applied (engineering) discipline, showed that teaching reflected differences in disciplinary knowledge validation. That is, whereas physics lecturers emphasised with the need to verify the correctness of every procedure with basic mathematical and physical principles, and had the need to thoroughly understand why procedures work, engineering lecturers emphasised the need to understand how

processes work and how to apply them while accepting their correctness as a given fact without the need for any verification.

Other studies about disciplinary differences at university level involve educational goals. Lecturers in soft disciplines put greater importance on goals like providing a broad general education and knowledge (Gaff & Wilson, 1971; Lattuca & Stark, 1995; Braxton, 1995). In addition, students were expected to enhance their powers of analysis and synthesis, and their critical thinking and creativity in soft areas (Lattuca & Stark, 1995; Braxton, 1995). Furthermore, student character development was more highly endorsed by faculty in soft disciplines (Smart & Elton, 1982; Braxton, 1995; Hativa, 1997). In contrast, lecturers in hard fields gave greater importance to student career preparation as a teaching goal (Gaff & Wilson, 1971). In addition, students were expected to enhance their power of logical reasoning, especially their ability to apply and test out ideas and to understand and interpret theory in hard areas. Furthermore, facts, principles and concepts hold a prominent place in the acquisition of knowledge in hard disciplines (Lattuca & Stark, 1994, 1995; Braxton, 1995; Smart & Ethington, 1995; Hativa, 1997).

Compared with studies of disciplinary differences in concepts of teaching at tertiary level, studies of disciplinary differences at school level are limited. Stodolsky and Grossman (1995) found that high school teachers in the five academic subjects – English, maths, science, social studies, and foreign language – viewed their school subjects differently. Regarding conceptions of subject matter, while all teachers saw their subjects as defined, maths and foreign language teachers agreed more strongly than teachers of English, social studies, or science that their subjects were clearly defined. Specifically, English teachers most strongly saw knowledge in their field as changing, whereas maths teachers tended to see their subject as less dynamic and more 'cut-and-dry'. Another difference was how the curriculum was arranged for students of varying abilities: maths and science teachers more strongly endorsed student differentiation or tracking, which might imply that they believed in the role of ability in learning maths and science.

2.4.3 The nature of teaching

Some studies at tertiary level highlight disciplinary differences, not only in hours of teaching, but also in research supervision. Concerning hours of teaching, Smeby (1996) demonstrated that academics in soft pure disciplines spent the most time

teaching and preparing, whereas those in hard applied disciplines spent the least. With regard to supervision, academics in soft pure areas spent the least amount of time on supervision, whereas those in hard pure and hard applied fields viewed their research supervision as integrated with their own research (Smeby, 1996). Becher et al. (1994) revealed that the supervisory process in soft pure fields was an individual apprenticeship model, whereas hard pure disciplines displayed a group-based apprenticeship model.

2.4.4 Teaching approaches

Summarising previous studies of disciplinary differences in types of teaching, Neumann and Becher (2002) reported that teaching in 'hard' disciplines generally involved mass lectures and problem-based seminars, while 'soft' disciplines involved more face-to-face class meetings and tutorial teaching, including discussions and debates.

In recent years, a number of studies have been conducted to investigate disciplinary differences in teaching approaches at tertiary level. Trigwell (2002) found that design teachers were significantly more student-centred than science teachers. Similarly, Lueddeke (2003) showed that teachers from 'hard' disciplines, such as the physical sciences, engineering, and medicine, took a more teacher-centred approach to teaching, whereas teachers from 'soft' disciplines were less likely to apply a teacher-centred approach to teaching.

Consistent with previous studies, Lindblom-Ylänne et al. (2006) found that there was systematic variation in both student- focused and teacher-focused approaches to teaching across disciplines. That is, teachers from 'hard' disciplines were more likely to report a more teacher-focused approach to teaching, while those teaching 'soft' disciplines were more student-focused.

2.4.5 Group characteristics of teachers

This section addresses the variations among teachers of different disciplines. With regard to commitment and collaboration, university teachers in hard pure fields generally manifest a strong commitment to research and a weaker commitment to teaching (Biglan, 1973b; Smedy, 1996) due to the competitive nature of the working environment. Moreover, they are apt to work cooperatively because research tends to involve collaboration (Biglan, 1973b). In contrast, academics in soft pure fields

demonstrate less experience of collaborative work, and thus they have a higher resistance to joint teaching due to their fields being less competitive and demanding less commitment (Biglan, 1973b). Concerning teaching emphasis, scholars in soft areas stress educating the whole student and show more personal commitment to students than those in physical sciences (Gamson, 1966; Vreeland & Bidwell, 1966).

In short, the aforementioned studies show that there has been substantial research on disciplinary differences at tertiary level over the past few decades. However, limited attention has been paid to the issue of whether, and how, teaching varies across the various disciplines at school level.

2.5 Job characteristics

As 'job characteristics' seems particularly appropriate for helping understand teachers' work motivation toward different teaching tasks, the following sections address extant literature related to the present study.

2.5.1 Historical background and theoretical framework of job characteristics

It is often argued by scholars that job performance can be increased through the cultivation of perceptions of task significance (Grant, 2008). Two lines of research – job design (Hackman & Oldham, 1975) as well as social information processing (Salancik & Pfeffer, 1978) – posit that when employees perceive their job to be high in task significance, they present higher work motivation and job performance.

Building on the pioneering work by Turner and Lawrence (1965), Hulin and Blood (1968), and Hackman and Lawler (1971), job design researchers such as Hackman and Oldham (1975, 1980) proposed a job characteristic theory, stating that a job possessing certain characteristics – 'skill variety, task identity, task significance, autonomy, and feedback' – creates the critical psychological states that influence employees' work motivation, satisfaction, and performance. Specifically, 'skill variety, task identity, and task significance' enables employees to experience their work as meaningful, 'autonomy' allows them to experience responsibility for the outcomes of the work, and 'feedback' gives them knowledge about the results of their work.

According to Hackman and Oldham (1980, p. 81), a job that is high in motivating potential must be high in at least one of the three characteristics that

prompt experienced meaningfulness, and also high in both autonomy and feedback. These researchers conceptualise the characteristics of the job itself as objective and seek to enhance work motivation by structurally redesigning tasks to enrich employees' perceptions of their job's significance (Steers & Mowday, 1977).

However, the job characteristic theory and theoretical tradition come under attack from measurement deficiencies (Aldag et al., 1981) and "inconsistencies in the task design area across the theory, operationalisations, analyses, and interpretations" (Roberts & Glick, 1981, p. 211). From an alternative perspective, social information processing researchers conceptualise task perceptions as a socially structured reality that evolves from informational cues in the workplaces (Salancik & Pfeffer, 1978). These informational cues refer to the individual's social environment, which may provide cues concerning 1) "which dimensions might be used to characterise the work environment; 2) how the individual should weight the various dimensions; 3) how others have to come to evaluate the work environment; and 4) the social context provides direct evaluation of the work setting along positive or negative dimension, leaving it to the individual to construct a rationale to make sense of generally shared affective reactions" (Pfeffer, 1981, p. 10). In general, researchers of this line of thought conclude that social cues play a pivotal role in shaping employees' perceptions of tasks.

The controversial issue of whether job characteristics are perceived as objective or subjective is resolved by a meta-analysis of 200 studies conducted by Fried and Ferris (1987). The data of the study clearly suggests that objective and perceived job characteristics are related. Therefore, they concluded that "it is inappropriate to totally dismiss perceptual and correlational results as simply artificial in nature…; however, other factors (e.g., social cues, method variance, etc.) must be acknowledged as potential sources of variation" (Fried & Ferris, 1987, p. 309).

2.5.2 Studies of job characteristics

A number of studies demonstrate that task significance has a great influence on employees' motivation. Hackman and Oldham (1980) found that task significance, experienced responsibility for work, and internal work motivation presented the top three levels of motivation among the professional and service job families. Barnabé and Burns (1994) showed that task significance had the highest levels of motivation for teachers in Quebec to do their jobs, and was followed by experienced

meaningfulness of work and internal work motivation. Compared with Hackman and Oldham's (1980) study, two notable differences in 'Means' were found regarding task significance (teacher 6.0 vs. professionals 5.6) and experienced responsibility (teacher 5.0 vs. professionals 5.8 and vs. service 5.6). This may suggest that teachers view their job as more meaningful and valuable job than those in other lines of work.

Gagné et al. (1997) reported that feelings of meaningfulness were significantly associated with task significance, and intrinsic motivation was positively related to feelings of meaningfulness at work and to feelings of autonomy. The results revealed that the more meaningful the work was perceived to be, the more intrinsically motivated employees felt. Nevertheless, two major meta-analyses of the job design literature indicate that there are weak relationships between task significance and objective and subjective measures of job performance (Fried & Ferries, 1987; Humphrey et al., 2007).

In response to existing inconsistent relationships between task significance and job performance, researchers recently called for more attention to be paid to relational mechanism (Humphrey et al., 2007; Morgeson & Humphrey, 2006). For example, Grant (2007) found that task significance would improve job performance by signalling to employees that their effort improved the welfare of others. Likewise, Grant (2008) revealed that task significance enhanced job dedication and helped behaviour of lifeguards. Furthermore, these effects were mediated by increases in perceptions of social impact and social worth.

Briefly, employees' perceptions of task significance are, to some extent, related to their level and type of motivation and job performance.

2.6 Conclusion

To sum up, the above studies on teacher motivation mainly focus either on teacher job satisfaction from the point of view of need theories as well as motivation-hygiene theory or on teacher self-efficacy from the point of view of a social cognitive theory. Researchers from diverse fields and theoretical orientations around the world have recently noticed this phenomenon and applied well-developed theories of motivation research to the domain of teaching (Richardson & Watt, 2010; Watt & Richardson, 2008). But their main concern is the link between teacher motivation and student motivation, or the investigation of the effect of teacher autonomy support on student motivation. There is a lack of research on teacher motivation toward teaching

tasks across subjects.

Given the multiple tasks that teachers perform, and the difficulty of precisely identifying the relative impact of each teaching task on teachers' psychological functioning, self-determination theory provides a potentially useful theoretical framework for understanding teachers' motivation due to its measurement of the quantity and quality of motivation (Fernet et al., 2008). Additionally, although considerable research on disciplinary differences at university level has been conducted in the past few decades, there is limited research on the effect of discipline on teaching at school level. Consequently, an investigation of Taiwanese senior high school teachers' motivation toward teaching tasks across subjects is necessary.

Chapter 3

Research Methodology

This chapter is divided into three major sections – one, two, and three.

Section one describes research methodology and addresses the quantitative research approach, qualitative research approach, and mixed methods research approach.

Section two discusses research methods. It contains a questionnaire, interviews, and phenomenography.

Section three outlines research design which includes two parts: a quantitative study and a qualitative study. Part one – the quantitative study – describes sampling, construction of questionnaires, data collection and data analysis. Part two – the qualitative study – deals with sampling, construction of interviews, interview data collection, and interview data analysis.

3.1 Research approach

Research approaches are broadly categorised into three paradigms: quantitative, qualitative, and mixed (Creswell, 2008; Cohen et al., 2007; Bryman, 2008; Robson, 2011). These three paradigms are discussed in the following sections.

3.1.1 Quantitative research approach

The quantitative research paradigm is closely linked to positivism, which emphasises the 'standard view' of science, believes in the existence of an external reality and seeks to describe it by general law and theories, regards the researcher as 'value-free' and the researched as depersonalised beings (Robson, 2011), and believes it is possible to gain knowledge of the world through the direct measurement of the phenomenon under investigation (Waring, 2012). Quantitative research investigates questions and/or hypotheses that are subjected to empirical testing for verification (Waring, 2012). It is mainly composed of experiments, surveys, and questionnaires with a large number of individuals, and tends to describe trends or give explanation for the relationships between variables by collecting quantifiable data and yielding clearly definable and comparable results (Creswell, 2008).

3.1.2. Qualitative research approach

The qualitative research paradigm, mainly based on social constructionism, stresses the world of experience constructed by human beings through interactions between people and the subsequent interpretation of the experiences in certain settings or contexts (Bryman, 2008; Robson, 2011). It accepts many realities from the researched and the researcher, and seeks to acquire multiple perspectives of social constructions of meaning and knowledge (Bryman, 2008; Robson, 2011). Qualitative research, on the other hand, maintains that individual construction can be elicited through "a dialectical interchange" between an investigator and a respondent, and develops knowledge through a process of interpretation (Waring, 2012, p. 19). It is largely made up of interviews, observations, diaries, and other instruments with a small number of individuals, and tends to explore and understand a central phenomenon by asking open questions and yielding participants' views (Creswell, 2008).

3.1.3 Mixed methods research approach

A mixed methods approach is based on 'pragmatism', which recognises the existence of the physical or natural world as well as the importance of the social and psychological world, views knowledge as the reality of the world and constructed by human beings, and sees meaning and truth as tentative and as changing over time (Robson, 2011). Pragmatism advocates "practical value for dealing with a specific research problem"(Denscombe, 2008, p. 80). That is, pragmatism contends that researchers should use "whatever philosophical or methodological approach works best for the particular research problem at issue" (Robson, 2011, p, 28).

However, some researchers argue that combining quantitative and qualitative research approaches is incompatible with epistemological assumption, values, and methods (Bryman, 2008; Robson, 2011). Despite the dispute, Tashakkori and Teddlie (1998) assert that pragmatism can be employed as "the philosophical underpinning for using mixed methods" (p. 167).

3.1.3.1 Advantages and disadvantages of mixed methods research

Mixed methods research, developed from the notion of 'triangulation' (Biesta, 2012), is defined as "a procedure for collecting, analysing, and 'mixing' both quantitative and qualitative research and methods in a single study to understand a

research problem" (Creswell, 2012, p. 535). The advantages and disadvantages of mixed methods research are discussed below.

Mixed methods research can enhance the strength and validity of research findings and lead to stronger inferences by triangulating quantitative and qualitative data (Biesta, 2012; Creswell, 2012; Robson, 2011). Another important attribute of a combination of research approaches is that it can generate a more accurate, adequate, and in-depth understanding, and produce a more complete and comprehensive picture of social phenomena (Biesta, 2012; Creswell, 2012; Robson, 2011). More importantly, this design has an ability to deal with complex phenomena and situations in real world settings (Robson, 2011). For example, when one type of research approach is not enough to address the research problem, a different approach can be used to collect more data to elaborate on, clarify, explain, and confirm findings (Creswell, 2012; Jang et al., 2008; Robson, 2011).

However, mixed methods research poses challenges to researchers, such as limited financial resources or projects that are large in scale (Biesta, 2012). Additionally, the procedures of mixed methods research design are time-consuming and require extensive data collection and analysis (Bryman, 1988). Moreover, researchers have to fully integrate the quantitative and qualitative components when the research is written up (Robson, 2011). In spite of these challenges, a mixed methods research design can be employed according to the overall purpose of the research, to what extent the research might address the problem, and whether the analysis of the data is congruent with the design of the research (Biesta, 2012).

A mixed methods research design was used as the means of investigation in this study because it serves the purpose and research questions of the present study. The quantitative research approach was first adopted to seek to understand a general trend of senior high school teachers' motivation toward work tasks in Taiwan, and the subsequent follow-up (a qualitative approach) was used to explain unexpected findings that emerged in the quantitative research. That is, qualitative data can illuminate quantitative findings and put 'meat on the bones' of dry quantitative data (Bryman, 2006a). In doing so, this study could allow a more accurate, comprehensive, and in-depth understanding of Taiwanese teachers' motivation toward particular professional tasks across subjects.

3.2 Research methods

Research methods include the "techniques and procedures used in the process of data gathering" (Cohen et al., 2000, p. 44). They involve a specific instrument such as a questionnaire, an interview schedule, or an observation. Gass and Mackey (2007) and Gay and Airasian (2003) assert that it is feasible to combine quantitative and qualitative research methods in the same study for the purpose of clarifying unclear questions and providing further explanation. The present study first employed questionnaires to get a general picture of Taiwanese senior high school teachers' motivation toward work tasks across subjects. Then, one-on-one interviews were administered to elicit information for findings that had not been expected. Finally, phenomenography was incorporated as a research method to analyse the interview data.

3.2.1 Questionnaires

Questionnaires are a commonly used social research method of data collection (Bryman, 2008; Robson, 2011) because of four main reasons: exploratory work, description of a population, outcomes or controls in studies, and feedback (Tymms, 2012). A review of the literature on work motivation also shows that questionnaires are widely used for the investigation of work/teacher motivation in terms of SDT (e.g., Baard et al., 2004; Pelletier et al., 2002; Fernet et al., 2008; Fernet et al., 2012; Roth et al., 2007). Questionnaires were used in this study because they present the best way to catch the levels and types of motivation and thereby describe Taiwanese senior high school teachers' motivation toward work tasks across subjects.

3.2.1.1 Advantages and disadvantages of self-completion questionnaires over interviews

Questionnaires have a number of advantages over interviews. One is that the questionnaire tends to be more reliable because of respondents' anonymity and the absence of interviewer effects (Cohen et al., 2007; Bryman, 2008). Namely, participants' anonymity and the absence of an interviewer can give a greater degree of accuracy and validity and avoid bias. Another is that carrying out questionnaires is more economical in terms of time and money (Cohen et al., 2007; Bryman, 2008). Still another is that questionnaires are more convenient for respondents because they can fill in a questionnaire whenever they want (Bryman, 2008).

Disadvantages of self-completion questionnaires are listed below (Bryman, 2008; Cohen et al., 2007; Robson, 2011). They have lower response rates, which lead to uncertainty as to whether the sample of respondents is representative of the whole. In addition, they are likely to run a greater risk of missing data due to a lack of prompting or supervision. Moreover, respondents do not necessarily report their attitudes and beliefs, etc. accurately. Furthermore, there is no opportunity to probe respondents to elicit more complex responses. Finally, ambiguities in the questions may not be detected.

3.2.2 Interviews

An interview is the major way of collecting qualitative data that is used by researchers in the disciplines of both psychology and sociology (Potter & Hepburn, 2005; Berg & Lune, 2012). Interviewing can be used not only as a primary approach for collecting data, but also as a means for triangulating data in mixed methods designs or a multi-method approach (Mears, 2012; Robson, 2011).

Interviews are simply defined as "a conversation with a purpose" (Berg & Lune , 2012, p. 105) or a face-to-face "purposeful interaction" (Berg & Lune, 2012; Mears, 2012), in which an interviewer makes an attempt to "learn what another person knows about the topic, to discover and record what that person has experienced, what he or she thinks and feels about it, and what significance or meaning it might have" (Mears, 2012, p. 170).

Interviews can produce a deeper understanding of a social phenomenon (Robson, 2011) and appreciation for the different circumstances of people's lives. Interviewing allows a researcher to learn from the qualities of another person's experiences and the significance of situations or events (Mears, 2012). Namely, it provides a path for a researcher to discover another person's perspective about an event or circumstance and to gain a greater understanding of a social phenomenon.

Interviews were used in the present study for gathering data because interviewing permitted the researcher to collect important data that could not be obtained from questionnaires. That is, the interview has a great potential to produce vivid, thick, and rich material that can often "put flesh on the bones of questionnaire responses" (Bell, 2010, p. 161).

3.2.2.1 Advantages and disadvantages of interviews over self-completion questionnaires

Interview schedules have several advantages over the self-completion questionnaires which are listed below (Bell, 2010; Bryman, 2008; Robson, 2011). First, interview schedules are flexible and adaptable, i.e., the interviewer can adjust the sequence of questions, explain the meaning of questions, and repeat questions. Second, face-to-face interviews facilitate the establishment of rapport and motivation among respondents. Third, non-verbal cues can assist in data collection. Fourth, interviews provide useful information that researchers cannot obtain from questionnaires.

However, the lack of standardisation raises concerns about the reliability of interviews (Robson, 2011). Interviews are also time-consuming, as interviewers have to spend considerable time with a small number of participants (Mears, 2012). Moreover, biases cannot be ruled out, i.e., interviews provide information "filtered" through the views of the interviewers (Creswell, 2008). Furthermore, the presence of the interviewer may influence how the interviewee responds (Robson, 2011).

Interview schedules can either be structured, semi-structured, or unstructured (Berg & Lune, 2012; Robson, 2011; Cohen et al., 2007). As a semi-structured interview schedule was used in this study, the strengths and weaknesses of a semi-structured interview schedule are discussed in the following section.

3.2.2.2 Strengths and weaknesses of semi-structured interviews

A semi-structured interview can be located somewhere between a completely structured and a completely unstructured interview (Berg & Lune, 2012). The strengths of semi-structured interviews are described below. Semi-structured interviews are more flexible than structured interviews because interviewers have freedom in the sequencing of questions and interviewees also have a great deal of leeway to say what they want (Berg & Lune, 2012; Bryman, 2008). Another is that they permit interviewers to go "beyond what can be learned through focus groups or tightly scripted protocols", i.e., to explore participants' experiences and understanding of the world (Bryman, 2008; Mears, 2012, p, 170). However, semi-structured interviews increase the possibility of researcher bias because there is no longer a straightforward relationship between the questions asked and the conclusion drawn. Additionally, it has a mixed framework for analysis that makes data analysis harder

(Opie, 2004).

A semi-structured interview schedule was used in this study for several reasons: (1) it is widely used in flexible and mixed method designs (Robson, 2011), (2) it has the capability to provide insight into how participants view the world (Bryman, 2008), (3) it is the most commonly used data collection in phenomenography approach (Marton, 1986, 1994) – although some studies use alternative sources such as "group interviews, observations, drawings, written responses, and historical documents" (Marton, 1994, p. 4427; see also Marton & Booth, 1997, p. 132). In short, a semi-structured interview schedule enables researchers to bring individual interviewees to a state of 'meta-awareness' so that informants can articulate their conceptual thoughts about the issue under investigation (Marton, 1986; Marton & Booth, 1997; Harris, 2008).

3.2.2.3 Advantages and disadvantages of one-on-one interviews over group interviews

There are a number of methods for conducting interviews: one-on-one interviews, group interviews, telephone interviews, and email interviews. Each type of interview serves a different purpose, answers different research questions, and has its own advantages and disadvantages.

This study adopted one-on-one interviews because they are ideal for asking interviewees who are articulate to share their views and ideas comfortably (Creswell, 2008). Another advantage is that they are useful for probing into sensitive questions and enabling participants to ask questions or provide comments (Creswell, 2012). On the other hand, not all interviewees are comfortable about disclosing information about their personal experiences.

As the interview in this study aimed to identify the variations in teachers' conceptions of teaching, a group interview was not considered to be appropriate because it may "produce 'group think', discouraging individuals who hold a different view from speaking out in front of the other group members" (Cohen et al., 2007, p. 373).

3.2.3 Phenomenography

A review of the literature on research methods shows that phenomenography has

been commonly used for examining conceptions of teaching and learning in educational research (e.g., Akerlind, 2005; Harris, 2005, 2008; Marton & Booth, 1997; Marton & Pong, 2005; Marton, 1981, 1986; Newton & Newton, 2009). In Akerlind's (2008) opinion, phenomenography is best known as an empirical research approach "for investigating variation in conceptions of different educational phenomena – including learning, teaching, and particular disciplinary concepts" (Akerlind, 2008, p. 633). Thus, phenomenography serves the purpose of this study by answering certain questions about teaching and accounting for the limitations of the dominant quantitative methods in educational research (Marton, 1981, 1986; Marton & Booth, 1997).

Phenomenography is a methodology that aims to explore the qualitatively different ways in which people experience, perceive, apprehend or conceptualize a specific phenomenon (Marton, 1981), i.e., to characterise variations in people's experience (Richarson, 1999). Researchers in this tradition take a second-order perspective that does not make statements about the world, but about people's conceptions of the world, i.e., it attempts not to describe respondents' experiences, but rather their interpretation of that experience (Marton, 1981, 1986; Säljö, 1979, 1988). That is, the aim of phenomenography is not the phenomenon *per se*, but the relationships between the person and the phenomenon (Bowden, 2005).

Marton (1996) explains that phenomenography differs from other qualitative approaches as it seeks to identify the conceptions held by groups rather than individuals for a particular phenomenon. Unlike other qualitative approaches that aim for 'an individual analysis' of individual experience, phenomenography aims for 'a collective analysis' of individual experience (Akerlind, 2005). It does not attempt to postulate that the participant holds specific conceptions, but to search for evidence to illustrate the range of conceptions present within the population under study (Harris, 2008). Phenomenography is mainly different from phenomenology as it focuses on "the variation of experience", i.e., variation in human meaning, understanding, and conceptions, whereas phenomenology focuses on "the essence of experience", i.e., a return to 'the things themselves' (Marton, 1986, p. 40 – 41). Another difference between these two approaches is that the former centres on the second-order perspective, i.e., describing people's experience of various aspects of the world, whereas the latter centres on the first-order perspective, i.e., describing various aspects of the world (Marton, 1981, 1986).

Phenomenogrphic data analysis is often described as a process of 'discovery' owing to the fact that the set of categories of description emerge from the data (Hasselgren & Beach, 1997). This set of 'categories of description', called the outcome of a phenomenographic analysis, is typically a set of hierarchical inclusive relationships (Marton, 1986; Marton & Booth, 1997), although leaner and branched relationships can also occur (Akerlind, 2005).

The 'outcome space' of these categories of description represents different understandings of a phenomenon. Marton and Booth (1997) propose three primary criteria for judging the quality of a phenomenographic outcome space: 1) each category in the outcome space should indicate something distinctive about a particular way of understanding a phenomenon, 2) the categories should be logically related to one another, frequently as a hierarchical inclusive relationship, and 3) the outcomes should be parsimonious (i.e., the critical variation of experiences in the data should be represented by as few categories as possible). Akerlind (2005) further proposes that a fundamental feature of the constitution of categories of description is "the search for key qualitative similarities within and differences between the categories" (p. 324).

3.3 Research design

A mixed methods research design was adopted for the means of investigation in this study. That is, the present study used a combination of quantitative and qualitative data to get a better understanding of a particular research problem under investigation.

Part one: A quantitative study

Part one of the study is a 5 (subject type: Chinese, English, math, science, and social studies teachers) by 5 (task type: class preparation, teaching, evaluation of students, classroom management, and administrative tasks) factorial design.

3.3.1 Sampling

It is possible to argue that probability sampling could be used to claim that "the sample is representative of the population and as such, can make generalizations of the population" (Creswell, 2008, p. 142). In this study, however, this was not feasible, since most teachers were uncomfortable and unwilling to participate in the study. One alternative would be to use non-probability sampling, i.e., convenience sampling for questionnaires. The researcher could access teachers who were willing and available

to be studied. In this case, the researcher could not say that the participants were representative of the population; however, the respondents could offer "useful information for answering questions" (Creswell, 2008, p. 146).

3.3.1.1 Sample size

A general rule of thumb for selecting the size of a sample is to "select as large a sample as possible from the population because "the larger the sample, the less the potential error that the sample will be different from the population" (Creswell, 2008, p. 156). Namely, large samples would be more representative of the population, and thereby raise the possibility of generalising research results to the population as a whole. The sample size for this survey is 283 teachers who teach Chinese, English, maths, science, and social studies. This number is close to what Creswell (2008) suggests the number for a survey study should be (350 individuals).

3.3.1.2 The sample

The sample consisted of 283 practising teachers. The sample included almost equal numbers of teachers across subjects (Chinese = 58, English = 55, maths = 55, science = 58, social studies = 57). From this group, thirty teachers were interviewed using semi-structured interviews.

The sample was drawn from eleven public senior high schools located in northern Taiwan (see Appendix 3.1 for details).

Age

The age of the teachers is given in Table 3.1. A high proportion of the sample (54.4%) is aged from forty to fifty-one. This reflects the fact that over half of the teachers received their primary and secondary school education before the late 1980s. This implies that they got their schooling under a national curriculum in which students had to take a course called 'Citizenship and Morality' and another course called 'The Four Books': 'Confucian Analects', 'The Great Learning', 'The Works of Mencius', and 'The Doctrine of the Mean'. These courses emphasised moral education and self-cultivation, and might have a profound influence on their conceptions of morality and self-cultivation.

Table 3.1

Age of Teachers in Sample

Years	Frequency	%
25-27	19	6.7
28-30	26	9.2
31-33	26	9.2
34-36	28	9.9
37-39	30	10.6
40-42	45	15.9
43-45	39	13.8
46-48	38	13.4
49-51	32	11.3
Total	283	100.0

Sex

Table 3.2 illustrates the sample by sex. Female teachers outnumber male teachers by a ratio of 2:1.

Table 3.2

Sex of Teachers

	Frequency	%
Male	85	30.0
Female	198	70.0
Total	283	100.0

Years of teaching

Table3.3 provides the sample's years of teaching experience. A high proportion of the sample (57.1%) has been teaching for more than thirteen years. This reflects the fact that over half of all teachers have lots of experience and may have a clear concept of the teacher's role, teaching, the student's role, and learning.

Table 3.3

Years of Teaching in Sample

Years of teaching	Frequency	%
1-3	37	13.1
4-6	26	9.2
7-9	28	9.9
10-12	30	10.6
13-15	38	13.4
16-18	40	14.1
19-21	30	10.6
22-24	25	8.8
25	29	10.2
Total	283	100.0

3.3.2 Construction of questionnaires

3.3.2.1. Work tasks motivation scale for teachers

The Work Tasks Motivation Scale for Teachers (WTMST), developed by Fernet et al. (2008), was adopted to explore teachers' motivation toward specific work tasks across subjects in this study. The WTMST was developed on the basis of the framework of self-determination theory (SDT; Deci & Ryan, 1985b, 2000), which provides "a multidimensional conceptualization of motivation that allows the assessment of level of motivation and type of motivation" (Gagné et al., 2010, p. 628 – 629).

The WTMST is a self-reporting survey that consists of five motivational constructs related to six different work tasks. The six work tasks include (1) class preparation, (2) teaching, (3) evaluation of students, (4) classroom management, (5) administrative tasks, and (6) complementary tasks. Each task is assessed by five subscales: intrinsic motivation, identified, introjected, and external regulation, and amotivation. The subscales each contain three items, each of which addresses a possible reason for engaging in a particular task (see Appendix 3.2).

3.3.2.2 Revised scale structure

The revised Work Tasks Motivation Scale for Teachers (WTMST) used in this study only consists of five work tasks, because this is enough to serves the purpose of this study, and also because the original WTMST is too long and may decrease the response rate.

The five work tasks are (1) class preparation, (2) teaching, (3) evaluation of students, (4) classroom management, and (5) administrative tasks.

Each work task contains 15 items. The 75 items of WTMST measure teachers' motivation toward specific job tasks with a Likert-type scale ranging from "1: never or almost never correspond" to "5: correspond completely." A higher point indicates higher correspondence with the statement. The Likert-type scale has been used in this study because the aim of the Likert scale is to "measure intensity of feeling about the area in question" (Bryman, 2008, p. 146). Another reason is that respondents are easy to tick five Likert-type questions, and this can increase the response rate (Tymms, 2012).

3.3.2.3 Questionnaire

One questionnaire composed of five parts was used to collect information on teacher motivation toward the five work tasks in this study (see Appendix 3.3). According to Creswell's (2012) suggestions, the first part included a short letter indicating the importance of participants and the value of their response. It also contained the purpose of the study, which informed the participant of the nature of the study and gave assurance of the confidentiality of their responses. The second part contained several closed demographic questions about the participant's background and was followed by the third part – instructions for answering five Likert-type questions.

The fourth part included the revised Chinese WTMST, which consisted of five sections. Each section had 15 items: Items 1 to 15 concerned 'class preparation', items 16 to 30 concerned 'teaching', items 31 to 45 concerned 'evaluation of students', items 46 to 60 concerned 'classroom management', and items 61 to 75 concerned 'administrative tasks'.

The fifth part contained open-ended questions to permit respondents to add their comments and suggestions, as suggested by Bell (2005, p. 147 – 148). At the end of the questionnaire was a box that asked respondents to leave their names and email

address if they would be interested in participating in a follow-up interview. A sentence thanking the participant for taking part in the study was at the bottom of the last page.

3.3.2.4 Piloting the questionnaire

In January 2011, a pilot study was undertaken to test whether the participants in the sample were capable of completing the survey and understanding the questions on the revised subscales of Chinese WTMST. It is because no pertaining information has been reported in previous studies conducted in Taiwan.

Eighty questionnaires were administered and collected by three teachers at three senior high schools located in northern Taiwan (two teachers distributed twenty-five questionnaires, and one teacher distributed thirty questionnaires). These three teachers were requested to look for equal numbers of teachers across subjects (i.e., Chinese, English, social studies, maths, and science) to respond to the questionnaire, and to explain to the participants the nature of the research, the purpose of the study, and the assurance of the confidentiality of their responses. The respondents were also told that the results of the survey would not be analysed by individual schools and only served as research data.

All the participants in the pilot study were asked to answer a number of questions suggested by Bell (2005) after they had completed the questionnaires. These questions were useful for offering feedback about the length, clarity, comprehensiveness, and layout of the questionnaire (see Appendix 3.3).

After two weeks, seventy-six questionnaires were returned and four questionnaires were missing. Feedback and suggestions about the questionnaire were also solicited to improve on ambiguous items. For example, some respondents commented that they had difficulty understanding the meaning of items15, 22, 41, 53, and 72 and therefore they did not know how to answer. All these items in the English version asked the same reason for doing different teaching tasks: "*To not feel bad if I don't do it*". This feedback was used as a reference to modify the questionnaire used in the main study.

3.3.2.5. Validity and reliability of questionnaire

3.3.2.5.1 Validity and reliability of the WTMST

Fernet and his colleagues (2008) claimed that the WTMST has good internal

consistency and construct validity. They reported that internal consistency values evaluated for the five types of motivation among the six work tasks were as follows: the Cronbach values ranged from .83 to .96 (mean *r* = .92) for intrinsic motivation, .72 to .89 (mean *r* = .82) for identified regulation, .79 to .89 (mean *r* = .85) for introjected regulation, .64 to .87 (mean *r* = .76) for external regulation, and .75 to .81 (mean *r* = .77) for amotivation. Overall, internal consistency values met the criterion of .70 proposed by Nunnally (1978). Concerning divergent validity, overall convergent correlations (mean *r* = .46) were higher than divergent correlations (mean *r* = .14).

Another study by Fernet et al. (2012) measured the reliability of the WTMST with four motivational constructs, including intrinsic motivation, identified regulation, introjected regulation, and external regulation, by calculating Hancock's coefficient (also called coefficient H). This coefficient estimates the stability of the latent construct across multiple observed variables by computing from standardised factor loadings. Coefficient H values for the four motivational constructs ranged from .71 to .96 at T1 and .76 to .88 at T2, satisfying the .70 cut-off value (Hancock & Mueller, 2001).

3.3.2.5.2 Validity of the Revised Chinese Scale

A good way to account for the content validity of questionnaires can be obtained from other academics' reflections on questionnaires' content and structure (Bryman, 2008; Cohen et al., 2007; Gass & Mackey, 2007). Thus, the WTMST was first translated into Chinese by the writer to prevent possible misunderstandings caused by the respondents' limited English ability. Next, the translated Chinese version was examined and revised by a high school Chinese teacher.

In order to ascertain the validity of the Chinese version of WTMST, two English language teachers provided me with useful advice and suggestions. For example, negative forms and words like '**not always**' and '**sometimes'** in the English version of item 2 "*I do**n't** know, I do**n't always** see the relevance of carrying out this task*," and item 10 "*I do**n't** know, **sometimes** I do**n't** see its purpose*," were recognised as problematic when translated into Chinese. Therefore, the Chinese characters 'bu' and 'chang' – negative forms – were omitted from the Chinese version.

After that, the Chinese version was submitted to another two Chinese teachers to get their feedback and suggestions concerning the appropriateness and clarity of the

scale statement. Some of the statements were reworded in response to these comments. For instance, the heading "Why are you '**doing administrative tasks**'?" in English version which was originally translated into Chinese as "Why are you '**chung shin hsing cheng kung tso**'?", was reworded as "Why are you '**chan yu hsiao wu kung tso**'?" and added '**in addition to teaching activities**'.

Another good strategy for explaining the validity of the questionnaire's construct can be achieved through factor analysis. To check whether the dimensions of the questionnaire in the Chinese version supported the intended dimensions of the original version, the results of the Chinese WTMST on the pilot sample were analysed using confirmatory factor analysis, and Cronbach's alpha was used to examine the reliability of the constructs.

Confirmatory factor analysis was performed to evaluate the factorial structure of the revised WTMST. In this 25-factor model, the writer used responses to 75 items (3 items × 25 motivational constructs) to infer 25 latent factors (5 motivational constructs × 5 work tasks). The factors were extracted using the principal axis factoring extraction method on SPSS (version 17.0), followed by Varimax rotation. Average loadings for each of the five subscales were as follows (see Table 3.4).

Table 3.4

Factor Loadings from the 25-Factor Confirmatory Factory Analysis Solution

Items	Class preparation factors	Teaching factors	Evaluation of students factors	Class management factors	Administr-tive tasks factors
Intrinsic motivation					
Item 1	**.80**	**.87**	**.86**	**.80**	**.74**
Item 2	**.82**	**.79**	**.70**	**.82**	**.80**
Item 3	**.82**	**.90**	**.84**	**.82**	**.86**
Identified regulation					
Item 1	**.78**	**.77**	**.41**	**.66**	**.72**
Item 2	**.72**	.20	**.75**	**.66**	**.79**
Item 3	**.43**	**.74**	.32	**.57**	**.61**
Introjected regulation					
Item 1	**.83**	**.81**	**.43**	**.53**	**.44**
Item 2	**.89**	**.86**	**.80**	**.46**	**.73**
Item 3	-.22	-.08	.02	-.10	-.13
External regulation					
Item 1	**.80**	**.71**	**.78**	**.73**	**.59**
Item 2	**.48**	**.81**	**.75**	**.65**	**.78**
Item 3	**.77**	**.84**	**.80**	**.82**	**.85**
Amotivation					
Item 1	**.81**	**.81**	**.78**	**.71**	**.86**
Item 2	**.54**	**.73**	**.76**	**.88**	**.80**
Item 3	**.76**	**.76**	**.87**	**.89**	**.70**

Extraction method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Note. Factor loadings > .40 in boldface.

3.3.2.5.3 Reliability of the Revised Chinese Scale

After the factor analysis, it was necessary to ensure the Chinese WTMST's reliability. The results of the Chinese WTMST on the pilot sample were analysed using Cronbach's alpha to examine the reliability coefficient of the constructs. Internal consistency values were evaluated for the five types of motivation among the five work tasks. Cronbach's alpha for each subscale was calculated, ranging from .79 to .89 (mean r = .84) for intrinsic motivation, .71 to .86 (mean r = .84) for identified

regulation, .06 to .31 (mean *r* = .15) for introjected regulation, .53 to .75 (mean *r* = .69) for external regulation, .73 to 85 (mean *r* = .78) for amotivation (see Table 3.5).

Table 3.5

Summary of the Reliability Analysis

	Class preparation	Teaching	Evaluation of students	Class management	Administra-tive tasks	Mean
Intrinsic motivation	**.834**	**.895**	**.799**	**.852**	**.888**	**.84**
Identified regulation	**.712**	**.823**	**.813**	**.864**	**.833**	**.84**
Introjected regulation	.234	.312	.088	.067	.112	.16
External regulation	**.539**	**.737**	**.709**	**.759**	**.754**	**.69**
Amotivation	**.731**	**.814**	**.820**	**.837**	**.857**	**.78**

Note. Cronbach's alpha > .60 in boldface.

Items 15, 22, 41, 53, and 72 for introjected regulation among the five work tasks were taken out because of the low reliability of .16 for the introjected regulation subscale, and also because negative feedback about these items were received on the pilot sample. After that, the Cronbach's values of the revised introjected regulation subscale ranged from .47 to .77 (mean = .66) (see Table 3.6). Overall, the internal consistency values of the revised WTMST (mean = .76) met the criterion of .70 proposed by Nunnally (1978).

Table 3.6

Revised Reliability Analysis of Introjected Regulation

	Class Preparation	Teaching	Evaluation of students	Class Management	Adminis-trative task	Mean
Introjected regulation	.234	.312	.088	.067	.112	.16
Revised introjected regulation	**.777**	**.725**	**.702**	**.475**	**.674**	**.66**

Note. Cronbach's alpha > .60 in boldface.

Conclusion

Based on the results of the factor and reliability analyses, as well as suggestions

and feedback given by the participants in the pilot study, items 15, 22, 41, 53, and 72 for introjected regulation among the five work tasks were omitted from the main study's questionnaire (see Appendix 3.4).

3.3.3 Data collection

There are several ways of administering questionnaires, including self-administration, post, face-to-face interview, telephone, internet, group administration, or house-hold-drop survey (Aldridge & Levine, 2001; Bell, 1993; Cohen et al., 2007; Gay & Airasian, 2003; Wilkinson & Birmingham, 2003). Although a mailed questionnaire is convenient and economical (Creswell, 2012), it is not feasible for this study because most of the teachers in Taiwan are not willing to reply to mail or email delivered by someone they do not know. Another disadvantage of a mailed questionnaire is that participants may misinterpret items on the survey without having it explained by someone (Creswell, 2012). Still another is a lower response rate.

To increase a high response rate, the researcher took some adequate precautions against the disadvantages of the questionnaire to gather research. First, the questionnaires were distributed by one teacher in each school to avoid a misinterpretation of items and to produce a high response rate. As Tymms (2012) states, "If one addresses a specific person…, the response rate is going to be better" (p. 236). Second, the questionnaire used five Likert-type questions for respondents to easily tick, which helped increase the response rate (Tymms, 2012). Third, a clear understanding of the language was assured by a careful and close check of the content and structure of the questionnaire by a number of experts in Chinese and English. Fourth, according to Creswell (2012), a brief instrument usually encourages a high return rate, and so the instrument used in this study consisted of three pages that took fifteen minutes to complete. Finally, modest incentives, like a small pack of breakfast cereal, were used as a token of gratitude. However, studies show mixed results concerning the impact of incentives (Creswell, 2012). Creswell suggests that the above-mentioned measures were likely to "create a stronger claim in generalizing results from the sample to the population" (2012, p.280).

Data collection for the first stage of this study was carried out in Taiwan from April 2011 to May 2011. Two hundred and ninety-five questionnaires were delivered to teachers in eleven public senior high schools in northern Taiwan. Eleven individual

teachers were requested by the researcher to look for an equal number of teachers across subjects (i.e., Chinese, English, social studies, maths, and science) in the individual schools to respond to the questionnaire. They were also requested to explain to participants the nature of the research and the purpose of the study, and to assure them of the confidentiality of their responses. The respondents were also told that the results of the survey would not be analysed by individual schools and only served as research data. The teachers in charge of administering the questionnaires were asked to encourage teachers from each school to participate in the interview. The respondents were allowed to take the questionnaires home, which may "possibly lead to more data" (Gass & Mackey, 2007, p. 161).

Although dates were agreed on to return the questionnaires, some delay was experienced. A number of phone calls were made to encourage teachers to complete the remaining questionnaires. By the end of May, two hundred and eighty-six questionnaires were returned and nine were missing. The response rate was 95%, which is adequate for this study because "many survey studies in leading educational journals reported a response rate of 50% or better" (Creswell, 2012, p. 390). Three questionnaires were left out because two teachers did not complete all the questions and one teacher gave a neutral answer to every question.

3.3.4 Data analysis

The data was computed by the SPSS statistical package for Windows 17.0. Descriptive statistics for each variable were first analysed and summarised. Inferential statistics for three variables were analysed and summarised. A two-way ANOVA (5 × 5) was computed to examine the effect of a between-subjects factor, i.e., subject type (Chinese, English, social studies, maths, and science) and a between-subjects factor, i.e., task type (class preparation, teaching, evaluation of students, classroom management, and administrative task).

This ANOVA was run on five measures of teacher motivation, i.e., intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation. An acceptable level of significance was set at .05. In addition, tests of simple main effects were conducted to examine the differences in teacher motivation toward teaching tasks across subjects.

Part two: A qualitative study

Part two of the study employed phenomenography as a research method with the aim of discovering qualitatively different ways in which teachers viewed and conceptualised the role of the teacher, teaching, the role of the student, and learning.

3.3.5. Sampling

A volunteer sample was employed for the qualitative study. Volunteer sampling is sometimes inevitable because it is often the only option available for researchers (Cohen et al., 2007, p. 116). However, Cohen et al. (2007) argue that researchers who employ volunteer sampling should be very cautious of making any claims about representing the wider population.

3.3.5.1 The sample used for semi-structured interviews

The semi-structured interviews were undertaken with thirty practising teachers who had previously completed the questionnaire, expressed their interest to participate in the interview, and left their email addresses on the last section of the questionnaires. The sample consisted of a roughly equal number of five subjects (Chinese N = 6, English N = 6, social studies N = 5, maths N = 6, and science N = 7). The interviewees were drawn from eight senior high schools (see Appendix 3.5 for details).

Age

The age of the teachers is presented in Table 3.7. A high proportion of interviewees in this sample (56.6 %) are aged from forty-one to fifty-one. This indicates that over half of the teachers' conceptions of teaching and learning might have been affected by their primary and secondary schooling, which put a high value on moral education and self-cultivation (as I mentioned regarding the sample for the quantitative study above). It also reflects that teachers can acquire professional teaching competence.

Table 3.7

Age of Teachers in Sample

Years	Frequency	%
25-30	4	13.3
31-35	4	13.3
36-40	5	16.6
41-45	4	13.3
46-50	9	30.0
51	4	13.3
Total	30	100.0

Sex

Table 3.8 illustrates that female teachers outnumber male teachers by a ratio of 2:1.

Table 3.8

Sex of Teachers

	Frequency	%
Female	21	70.0
Male	9	30.0
Total	30	100.0

Years of teaching

The teacher's years of teaching is presented in Table 3.9. A high proportion of teachers in this sample (63.2 %) have experience of teaching for longer than sixteen years. This reflects that over half of the interviewees had more experience of teaching and knew the necessary information about teaching and learning, meaning that they could be considered 'good informants' (Robson, 2011)

Table 3.9

Years of Teaching

Years of teaching	Frequency	%
1-5	5	16.6
6-10	4	13.3
11-15	2	6.6
16-20	8	26.6
20-25	11	36.6
Total	30	100.0

3.3.6 Construction of an interview schedule

To guide the interview to produce the data related to the research questions, and to explain the issues not completely explained in the questionnaires, an interview schedule was developed. This interview schedule was based on the five commonly recognised dimensions, proposed by Kember (1997), from which teachers construct their conceptions of teaching. These five dimensions are 1) the essence of teaching and learning, 2) the roles of the teacher and the student, 3) the aims and expected outcomes of teaching, 4) the content of teaching, and 5) the preferred approaches to teaching.

Ten open-ended questions and two sub-questions composed of open-ended and closed questions were constructed (see Appendix 3.6A). The questions were broadly divided into three parts. The first part was concerned with teachers' ideas about the teacher's role, the second part focused on teachers' views and opinions on teaching, and the third part involved teachers' thoughts about the student's role and learning.

3.3.6.1 Piloting interview schedules

Prior to administering the interviews, the original interview schedule was piloted by the researcher.

Burg and Lune (2012, p. 127) suggest that once an interview schedule has been developed, it must be pretested for two stages to see if the language used is understandable to the interviewees. First, the schedule should be critically examined by experts familiar with the study's subject matter to identify poorly worded questions or questions revealing the investigator's bias or blind spots. The second stage involves

several practice interviews in order to assess how effectively the interview will work and whether the interviewer will get the information he/she is seeking. According to Burg and Lune's suggestion, the interview schedule used in this study was pretested for two stages.

First, the interview questions in English were closely examined and approved by the supervisor who guided this research. After the approval of the supervisor, the interview questions were translated into Chinese by the researcher in collaboration with a Chinese teacher. The Chinese version was further critically examined and revised by another two Chinese teachers. Then, the Chinese version was translated back into English by an English teacher (see Appendix 3.6B).

Secondly, two pre-pilot interviews were conducted with two teachers to see which questions were more or less motivating to interviewees (Gillham, 2000; Burg & Lune, 2012). The interview took place in their homes because informants talk more comfortably and freely 'on their own ground' (Gillham, 2000; Burg & Lune, 2012). At the end of the interview the researcher asked the interviewees for feedback and comments, which served as references to prioritise the topics and modify the interview questions. For example, one teacher mentioned **Question 9** "*Finally, in your opinion, A teacher is (like) _____ because _____. A student is (like) _____ because _____"* was close to **Question 1** *"What do you think is the main role of a high school teacher?"* and to **Question 8** *"What do you think is the main role and responsibility of the student?"* in meaning.

After rewording and regrouping questions based on the feedback and comments made by the two teachers in the pre-pilot interview, four interviews were carried out with four teachers who were representative of the senior high school teachers during the pilot interviews (see Appendix 3.7A/B). These interviews were conducted in Chinese in order to make sure that the interview questions were clear and to test the length of the interview. The interview took place in the counselling room in the school because it was a quiet and comfortable place.

Before the interview, the participants were informed of the purpose of the interview and were assured of their anonymity and confidentiality. They were encouraged to make suggestions and talk freely. Suggestions from the interviewees were used to modify the interview questions. For example, one teacher mentioned that **Question 6** "*What is your view of learning? What do you think is the purpose of learning?*" was very similar to **Question 7** "*In your opinion, what are indicators of*

good learning? Why?" in meaning. Another teacher said that **Question 8** should come before **Question 7**.

After the piloting, the researcher consulted with her supervisor about the result of the piloting in order to finalize the interview schedule of the main study. The following is the interview schedule for the main study (see Appendix 3.8 – Chinese version).

1 What do you think is the main role of a high school teacher?
2 What do you think is the responsibility of a high school teacher?
3 What is your view of teaching? What do you think is the aim of teaching?
4 In your opinion, what are indicators of good teaching? Why?
5 What are the most common strategies that you will employ in teaching? What are your reasons or principles for choosing these strategies?
   5.1 Do you believe that there is a need to teach different things in different ways to different students?
   5.2 Do you believe that students learn differently? If so, in what ways? Can you offer some illustrative examples?
6 What do you think is the role and responsibility of the student?
7 In your opinion, what are indicators of good learning? Why?
8 Please feel free to add any comments you like on the above-mentioned issues.

3.3.7 Administering interviews

Ethical issues in relation to interviews suggested by Bell (2010, p.160) and Robson (2011, p. 281) were given careful attention throughout. Before each interview, the researcher contacted the interviewee by phone and ensured that they fully understood what the research was about, why the researcher wished to interview them, what would be involved, and what the researcher would do with the information she obtained. The researcher sent emails to each interviewee in order to arrange a time that suited them. After receiving the interviewee's reply, the researcher made a call to make sure of the exact time to interview (see Appendix 3.9), and further asked them about places they thought would be the most comfortable to be interviewed. All of them replied that a counselling room in their individual schools was ideal because it was quiet and interruptions, background noise, or intrusive curiosity could be avoided. Therefore, all interviews were held in the counselling room in the participants' individual schools.

At the outset of the interviews, the researcher began with some factual questions about age, years of teaching experiences, the subject they taught, and their level of education. Then, the researcher introduced herself to the interviewee and told the interviewee about her background and interest in the area of inquiry by asking the question, "I am interested in learning about teacher's teaching ideas. Please tell me about your experience of teaching." This type of introduction can help establish a feeling of trust and rapport necessary to create the friendly and relaxed atmosphere that allows interviewees to fully disclose their experience and ideas.

The interviewee was once again reminded about the purpose and nature of the research, and was reassured that he/she would remain anonymous in the written report and that his/her responses would be treated with confidentiality. He/she could feel free to interrupt or to ask clarification of any questions, and was informed that there was no right or wrong answer, so he/she did not have to worry about this but to do the best he/she could to express his/her opinions and personal experiences. All participants were reminded of their right to stop or withdraw from the interview at any time. Each participant was asked for permission to record the interview. After all these explanations, the researcher asked the participant to sign a consent form (see Appendix 3.10). All the participants permitted the recording of their interviews.

Following this opening sequence, more important questions regarding teachers' opinions, ideas, and thoughts pertaining to their role, teaching and learning, and the role of the student were asked in accordance with the interview schedule. All the interviewees were asked about differences they had noticed in individual students' learning. At the end of the interview, the interviewees were asked to offer any comments that they might like to make about this study, and the interviewer made a statement of appreciation and gratitude for the teachers' participation and cooperation.

As Robson (2011) suggests, any type of interview "under half an hour is unlikely to be valuable; anything going much over an hour may be making unreasonable demands on busy interviewees" (p. 281). Hart, Rennison, and Gibson (2005) further point out that "longer interviews can produce 'respondent fatigue'" no matter what type of interviews interviewees are going to have (cited in Robson 2011, p. 281). For these reasons, the length of the interview for this study was about 40-60 minutes to yield the most valuable data and prevent interviewees from becoming tired.

After each interview, the recording was transcribed and translated into English by the researcher.

3.3.8 Interview data analysis

As Trigwell (2000) says, "phenomenography is one way of studying teaching from the perspective or experience of the teachers" (p. 63). The analysis of the verbatim transcripts of teacher interviews in this study was thus undertaken by the phenomenographic method.

The process of data analysis involves six stages, as suggested by Sjöström and Dahlgren's (2002) study. The first stage – the researcher became familiar with the data pool by repeated reading and rereading of the transcripts. The second stage – utterances which were found to be of interest for the question being investigated were selected and marked (Marton, 1986, p. 42). The selected quotes were judged based on three indicators recommended by Sjöström and Dahlgren (2002):

1) Frequency – how often an idea is articulated
2) Position – where the statement is positioned; often the most significant elements are found in the introductory parts of an answer
3) Pregnancy – when participants explicitly emphasize that certain aspects are more important than others (p. 341– 342).

The third stage – according to research questions, the selected quotes were typed on the Excel sheet for coding. The fourth stage – hard copies of the coding were scrutinized, and similar answers within the same code were colour marked and sorted into categories based on their similarities, which were then differentiated from another in terms of their differences. To put it more concretely, the process looked like the following: the selected quotes were sorted into piles, ambiguous cases were examined, and eventually the criterion ascribed to each group were made explicit (Akerlind, 2005). The fifth stage — as the categories progressed and new categories emerged, earlier categories were rearranged and selected quotes were reassigned so that self-consistent, mutually exclusive categories evolved (Newton & Newton, 2009).

This process of analysis "is strongly iterative and comparative … involving the continual sorting and resorting of data plus ongoing comparisons between data and the developing categories of description, as well as the categories themselves" (Akerlind, 2005, p. 324).

For example, the responses 'Students have to take notes in class' and 'students must have good time management' to interview Question 6 "What is the role of the student?" led to the initial group representing the category tentatively called "*Self-*

regulated learner". As later responses were added, e.g., 'Students have to do their duties', this category was considered to be inappropriate and another category was identified: *"Dutiful or responsible learner"*.

The sixth stage – each category was named, its features were listed, and the category was illustrated to form a 'category of description'. Each category described a conception of 'the teacher's role', 'teaching', 'good teaching', 'teaching methods of instruction', 'the student's role', 'good learning', and 'individual differences in learning'.

It is important to note that the researcher cannot say that the categories of description that emerged in this study are complete: interviews with other practising teachers may add new categories to it, and it should not be assumed that other conceptions do not exist among other practising teachers (Bolden, Harries, & Newton, 2010; Newton & Newton, 2009).

Reliability

The present study used two researchers who coded part of interview transcripts independently, compared categorisations, and reached agreement through discussion. This process is called "coder reliability check" and "dialogic reliability check" (Kvale, 1996), and it ensures quality and consistency in data interpretations.

3.4 Conclusion

This study used a mixed methods design providing both quantitative and qualitative data through questionnaires and interviews. A total of 283 practising teachers in 11 public senior high schools in northern Taiwan completed a questionnaire adapted from the Work Tasks Motivation Scale for Teachers (Fernet et al., 2008). The collected quantitative data was analysed by computing descriptive statistics and inferential statistics, which included two-way ANOVA. Thirty teachers were involved in the qualitative data collection using semi-structured interviews. The Phenomenographic method was used to analyse the interview data, to uncover the qualitatively different ways in which teachers experience and conceptualise teaching and learning.

Chapter 4

Results of Questionnaires

4.1 Introduction

With five levels for the subject type factor (i.e., Chinese, maths, English, Science, and social studies), five levels for the task type factor (i.e., class preparation, teaching, evaluation of students, classroom management, and administrative tasks), and five dependent variables (i.e., intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation), the analysis has been broken into several stages to help unpack the key findings.

Accordingly, this chapter is composed of three broad parts. Part one – consisting of two sections – reports the descriptive statistics of teacher motivation toward teaching tasks by subject and by task, respectively. Part two – made up of five sections – demonstrates the results regarding differences in subject and task in terms of five dependent variables. Part three presents an overall summary of the results and the link between the findings and hypotheses.

4.2 Descriptive statistics

4.2.1 Descriptive statistics of teacher motivation toward teaching tasks by subject

Descriptive statistics of the five dependent variables, i.e., average ratings for intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation, were computed to answer the first research question: what is the level and type of motivation of Taiwanese senior high school teachers toward teaching tasks across subjects?

In Table 4.1, the means and standard deviations for the five different dependent variables are presented. These five different dependent variables have been divided into three broad types of motivation: 1) autonomous forms of motivation (i.e., intrinsic motivation and identified regulation), 2) controlled forms of motivation (i.e., introjected regulation and external regulation), and 3) amotivation.

Table 4.1

Mean and Standard Deviation Scores for Subject and Task

Task	Subject	Autonomous Motivation				Controlled Motivation				Amotivation	
		IM		IdReg		InReg		ExtReg		Amot	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Class preparation	Chinese	4.04	0.7	4.18	0.5	3.97	0.9	3.09	0.8	1.61	0.6
	English	3.81	0.5	4.24	0.4	3.62	0.8	3.06	0.6	1.54	0.4
	Maths	3.96	0.7	4.20	0.5	3.32	1.03	3.30	0.5	1.61	0.5
	Science	4.14	0.6	4.36	0.5	3.80	0.7	3.02	0.7	1.45	0.5
	Social/s	4.04	0.6	4.44	0.5	4.12	0.7	3.01	0.8	1.49	0.5
	Total	**4.00**		**4.28**		**3.77**		**3.09**		**1.54**	
	Average	**4.14**				**3.43**					
Teaching	Chinese	4.15	0.5	4.33	0.4	4.17	0.6	2.88	0.9	1.59	0.6
	English	4.12	0.5	4.23	0.4	3.88	0.6	3.00	0.7	1.71	0.6
	Maths	4.20	0.5	4.29	0.4	3.67	0.8	3.09	0.7	1.53	0.4
	Science	4.31	0.5	4.35	0.5	3.77	0.9	2.90	0.9	1.42	0.5
	Social/s	4.14	0.6	4.37	0.4	3.99	0.7	2.96	0.8	1.59	0.5
	Total	**4.18**		**4.32**		**3.90**		**2.96**		**1.57**	
	Average	**4.25**				**3.43**					
Evaluation of students	Chinese	3.45	0.8	3.97	0.6	3.87	0.7	3.09	1.04	1.77	0.6
	English	3.29	0.7	3.86	0.6	3.48	0.8	3.20	0.8	1.87	0.6
	Maths	3.50	0.9	4.05	0.5	3.59	0.8	3.07	0.7	1.66	0.6
	Science	3.62	0.8	4.09	0.7	3.50	0.9	2.97	0.9	1.60	0.6
	Social/s	3.25	0.7	3.93	0.5	3.62	0.7	3.09	0.8	1.90	0.6
	Total	**3.42**		**3.98**		**3.61**		**3.08**		**1.76**	
	Average	**3.70**				**3.34**					
Classroom management	Chinese	3.28	0.9	4.15	0.6	4.02	0.6	3.20	0.9	1.77	0.6
	English	3.27	0.9	4.10	0.4	3.85	0.6	3.23	0.8	1.74	0.5
	Maths	3.60	0.9	4.14	0.5	3.70	0.7	3.21	0.7	1.62	0.6
	Science	3.18	0.8	4.04	0.6	3.79	0.7	2.98	0.8	1.62	0.7
	Social/s	2.88	0.8	3.96	0.6	3.68	0.8	3.14	0.8	1.81	0.7
	Total	**3.24**		**4.08**		**3.81**		**3.15**		**1.72**	
	Average	**3.66**				**3.48**					
Administra-tive tasks	Chinese	2.91	0.8	3.30	0.8	3.25	0.8	3.63	0.7	2.14	0.7
	English	2.82	0.8	3.20	0.7	3.07	0.7	3.67	0.7	2.12	0.6
	Maths	3.01	0.7	3.40	0.6	3.10	0.7	3.64	0.5	2.15	0.7
	Science	2.95	0.7	3.40	0.7	3.08	0.8	3.56	0.8	2.00	0.7
	Social/s	2.94	0.7	3.34	0.7	3.19	0.8	3.64	0.7	2.13	0.6
	Total	**2.93**		**3.33**		**3.14**		**3.63**		**2.11**	
	Average	**3.13**				**3.38**					

Note. The maximum mean for IM, IdReg, InReg, ExtReg, and Amot is 5, and the minimum mean is 1. Chinese N=58. English N=55. maths N=55. science N= 58. social studies N= 57. IM = intrinsic motivation. IdReg = identified regulation. InReg = introjected regulation. ExtReg = external regulation. Amot =amotivation.

Table 4.1 shows that teachers had the highest level of intrinsic motivation (M = 4.18), identified regulation (M = 4.32), and introjected regulation (M = 3.90) toward Teaching. On the contrary, teachers had the lowest level of intrinsic motivation (M =

2.93), identified regulation (M = 3.33), and introjected regulation (M = 3.14) toward administrative tasks. They presented the highest level of external regulation (M = 3.63) and amotivation (M = 2.11) toward administrative tasks.

The results indicate that, in general, teachers had a significantly higher level of autonomous motivation toward teaching than administrative tasks. They had a relatively high level of autonomous motivation toward five teaching tasks, i.e., class preparation (M = 4.14), teaching (M = 4.25), evaluation of students (M = 3.70), classroom management (M = 3.66), and administrative tasks (M = 3.13). Note that these teachers also presented a moderately high level of controlled motivation toward five teaching tasks, i.e., class preparation (M =3.43), teaching (M = 3.43), evaluation of students (M = 3.34), classroom management (M = 3.48), and administrative tasks (M = 3.38). It was surprising to see that teachers had a higher level of controlled motivation toward classroom management (M = 3.48) than toward administrative tasks (M = 3.38).

Examining the means in more detail in Table 4.1 reveals that science teachers had a higher level of intrinsic motivation toward class preparation (M =4.14), teaching (M = 4.31), and evaluation of students (M = 3.62) than teachers of the other four subjects. Maths teachers also presented the highest level of intrinsic motivation toward classroom management (M = 3.60) and administrative tasks (M = 3.01), compared with teachers of the other four subjects. With regard to identified regulation, social studies teachers had the highest level of identified regulation toward class preparation (M = 4.44), and teaching (M = 4.37), whereas science teachers had the highest level of identified regulation toward evaluation of students (M =4.09) and administrative tasks (M = 3.40).

With respect to introjected regulation, it is noteworthy that Chinese teachers presented the highest level of introjected regulation toward four types of teaching tasks, i.e., teaching (M = 4.17), evaluation of students (M = 3.87), classroom management (M = 4.02), and administrative tasks (3.25). In contrast, maths teachers presented the lowest level of introjected regulation toward class preparation (M= 3.32) and teaching (M = 3.67), and a relatively lower level of introjected regulation toward classroom management (M = 3.70) and administrative tasks (M = 3.10). Concerning external regulation, English teachers had the highest level of external regulation toward three types of teaching tasks, i.e., evaluation of students (M = 3.20), classroom management (M = 3.23), and administrative tasks (M = 3.67), whereas

maths teachers had the highest level of external regulation toward class preparation (M = 3.30) and teaching (M = 3.09). As for amotivation, all teachers presented a relatively lower level of amotivation toward five types of teaching tasks.

4.2.2 Descriptive statistics of teacher motivation by task

The same descriptive analysis given in Table 4.1 is presented in a slightly different way in Table 4.2, in which subject type has been collapsed. Under each mean is the row and column ranking. The first ranking is the row ranking that shows which type of motivation is descriptively higher for each task type. The second ranking is the column ranking that helps identify which type of task is perceived as the most motivating. As in Table 4.1, the five dependent variables have been sub-divided by a three-category version of the dependent variables.

Table 4.2

Mean and Standard Deviation Scores for Task Type Differences

	Autonomous Motivation		Controlled Motivation		Amotivation
	IM	IdReg	InReg	ExtReg	Amot
	M *SD*	*M* *SD*	*M* *SD*	*M* *SD*	*M* *SD*
Class preparation	4.00 0.6 (2, 2)	4.28 0.5 (1, 2)	3.77 0.9 (3, 3)	3.09 0.7 (4, 3)	1.54 0.5 (5, 5)
Teaching	4.18 0.5 (2, 1)	4.31 0.4 (1, 1)	3.89 0.7 (3, 1)	2.97 0.8 (4, 5)	1.57 0.5 (5, 4)
Evaluation of students	3.42 0.8 (3, 3)	3.98 0.6 (1, 4)	3.77 0.8 (2, 3)	3.08 0.8 (4, 4)	1.76 0.6 (5, 2)
Classroom management	3.24 0.9 (3, 4)	4.08 0.5 (1, 3)	3.81 0.7 (2, 2)	3.15 0.9 (4, 2)	1.72 0.6 (5, 3)
Administrative tasks	2.93 0.7 (4, 5)	3.33 0.7 (2, 5)	3.14 0.7 (3, 5)	3.63 0.8 (1, 1)	2.11 0.7 (5, 1)

Note. Values enclosed in parenthesis mean ranking by measure and by task type, respectively. The maximum mean for IM, IdReg, InReg, ExtReg, and Amot is 5, and the minimum mean is 1. IM =intrinsic motivation, IdReg = identified regulation, InReg = introjected regulation, ExtReg = external regulation, and Amot = amotivation. Number enclosed in parentheses represents rankings.

Table 4.2 illustrates Taiwanese senior high school teachers' intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation toward teaching tasks. In general, of the five types of motivation, teachers had the

highest level of identified regulation toward four teaching tasks, i.e., class preparation (M = 4.28), teaching (M = 4.31), evaluation of students (M = 3.98), and classroom management (M = 4.08). They also had a relatively high level of identified regulation toward administrative tasks (M = 3.33). The results suggest that teachers identified the values of these professional tasks, especially teaching.

As shown in Table 4.2, teaching again ranked first in three types of motivation, i.e., intrinsic motivation, identified regulation, and introjected regulation. Administrative tasks ranked first in external regulation. It is worth noting that classroom management ranked the second highest in introjected regulation in terms of level of motivation and task type.

4.3 Two-way ANOVA for subject and task difference

This section presents the analysis and results related to the second, third, and fourth research questions:

(2) Are there any differences between subject specialists in regard to teacher motivation toward teaching tasks?

(3) Does teacher motivation differ according to particular professional tasks?

(4) Is there an interaction between subject specialists and particular professional tasks in regard to teacher motivation?

To answer these questions, the analysis was computed using two-way ANOVA.

All the analyses for the five dependent variables were conducted using factorial ANOVA. Two factors were assessed. The within-subject factor was task type and consisted of five levels: class preparation, teaching, evaluation of students, classroom management, and administrative tasks. The between-subject factor was subject that the teachers taught and was composed of five levels: Chinese, maths, English, science, and social studies. For each analysis, where the interaction was significant, an analysis of simple main effects was completed.

For ease of reporting, each dependent variable was dealt with in turn.

4.3.1 Subject and task difference in intrinsic motivation

The mean ratings for intrinsic motivation are detailed in Table 4.3.

Table 4.3

Mean and Standard Deviation Scores for Intrinsic Motivation

	Class preparation	Teaching	Evaluation of students	Classroom management	Administrative tasks
	M *SD*	*M* *SD*	*M* *SD*	*M* *SD*	*M* *SD*
Chinese	4.04 0.7	4.15 0.5	3.45 0.8	3.28 0.9	2.91 0.8
English	3.81 0.5	4.12 0.5	3.29 0.7	3.27 0.9	2.82 0.8
Maths	3.96 0.7	4.20 0.5	3.50 0.9	3.60 0.9	3.01 0.7
Science	4.14 0.6	4.31 0.5	3.62 0.8	3.18 0.8	2.95 0.7
Social studies	4.04 0.6	4.14 0.6	3.25 0.7	2.88 0.8	2.94 0.7
Total	**4.00** 0.6	**4.18** 0.5	**3.42** 0.8	**3.24** 0.9	**2.93** 0.7
	(2)	(1)	(3)	(4)	(5)

Note. The maximum mean for intrinsic motivation is 5, and the minimum mean is 1. Numbers enclosed in parentheses represent rankings.

The mean in Table 4.3 suggest that teachers had particularly low ratings for intrinsic motivation toward administrative tasks and high ratings toward teaching. There also seems to be considerable variation by subject. Figure 4.1 supports this complex relationship between the two factors, where it seems that there are interactive effects between task type and subject.

To further examine the main effects of subject and task type on teachers' intrinsic motivation, a two-way ANOVA was computed and is presented in Table 4.4.

Table 4.4

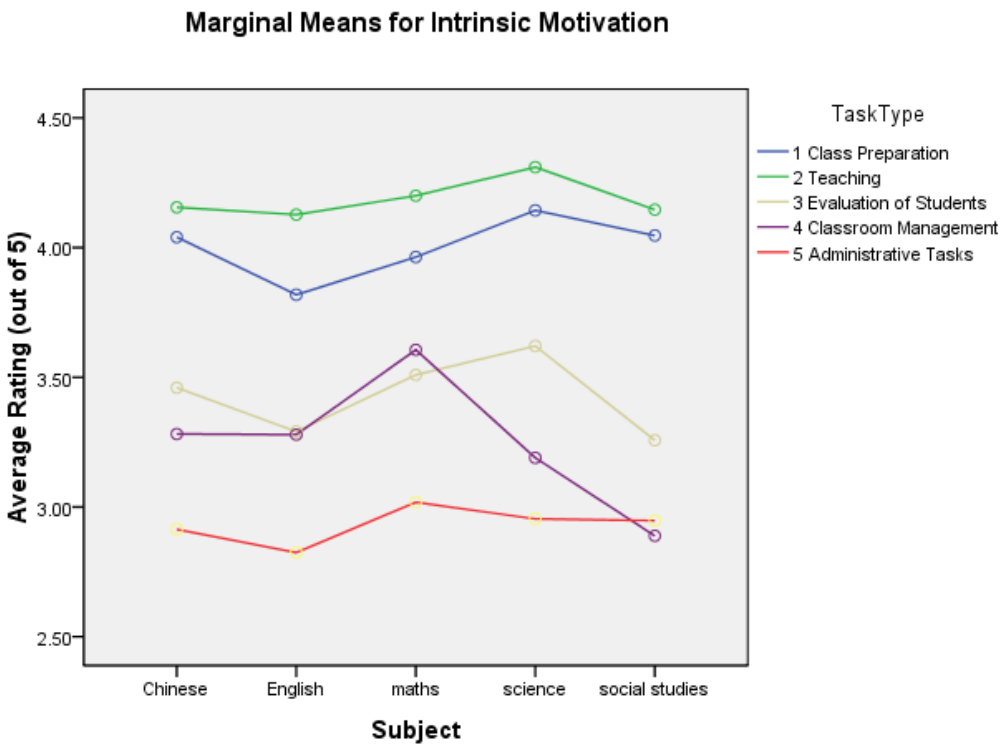
Two-Way Repeated Measures ANOVA for Subject Type and Task Type in Intrinsic Motivation

Source	*df*	*F*	$\acute{\eta}^2$	*p*
		Between	Subjects	
Subject Type (S)	4	1.44	.02	.21
		Within	Subjects	
Task Type (T)	4	261.93*	.48	.00
S × T	16	3.26*	.04	.00

Note. *$p < .05$.

As shown in Table 4.4, results of the 5 x 5 mixed design analysis of variance show a highly significant main effect for task type, $F(4, 1112) = 261.93$, $p < .001$ and no significant main effect for subject, $F(4, 278) = 1.44$, $p = .21$. As expected (from the patterns of mean in Table 3), these main effects were qualified by a significant interaction effect, $F(16, 1112) = 3.26$, $p < .001$. Therefore, tests of simple main effects were done. The interactive relationship between the within-subject factor, task type, and the between-subjects factor, subject, is shown in Figure 4.1.

Figure 4.1



Given there are so many small effects with the simple effects analysis, the following presents the main findings. Take task type first. Analysis of simple main effects reveals that there were significant differences for classroom management across subjects, $F(4, 278) = 4.40$, $p < .01$. Ratings for social studies were significantly lower than Chinese ($p < .05$), English ($p < .05$), and maths ($p < .001$). Ratings for science were also lower than maths ($p < .05$). The data thus suggests that intrinsic motivation seems to be most sensitive to teacher ratings of classroom management.

Turning to analysis by subject, there were significant effects across all five subjects. Unsurprisingly, as suggested by Figure 4.1, ratings for administrative tasks were the lowest across all subjects (most *p's* < .001). Although there were small effects, e.g., teaching > class preparation ($p < .05$), the broad analysis is largely that administrative tasks were rated the lowest.

4.3.2 Subject and task difference in identified regulation

The mean ratings provided in Table 4.5 are for identified regulation.

Table 4.5

Mean and Standard Deviation Scores for Identified Regulation

	Class preparation	Teaching	Evaluation of students	Classroom management	Administrative tasks
	M *SD*	*M* *SD*	*M* *SD*	*M* *SD*	*M* *SD*
Chinese	4.18 0.5	4.33 0.4	3.97 0.6	4.15 0.6	3.30 0.8
English	4.24 0.4	4.23 0.4	3.86 0.6	4.10 0.4	3.20 0.7
Maths	4.20 0.5	4.29 0.4	4.05 0.5	4.14 0.5	3.40 0.6
Science	4.36 0.5	4.35 0.5	4.09 0.7	4.04 0.6	3.40 0.7
Social studies	4.44 0.5	4.37 0.4	3.93 0.5	3.96 0.6	3.34 0.7
Total	**4.28** 0.5	**4.31** 0.4	**3.98** 0.6	**4.08** 0.5	**3.33** 0.7
	(2)	(1)	(4)	(3)	(5)

Note. The maximum mean for identified regulation is 5, and the minimum mean is 1. Numbers enclosed in parentheses represent rankings.

Consistent with the results in Table 4.3, Table 4.5 again illustrates that teachers had an especially low level of identified regulation toward administrative tasks and a significantly high level toward teaching. There also appears to be great variation across subjects. Figure 4.2, where it seems that there are interactive effects between task type and subject, supports this complex relationship between the two factors.

To look for the main effects of subject and task type on teachers' identified regulation, a two-way ANOVA was computed and is given in Table 4.6.

Table 4.6

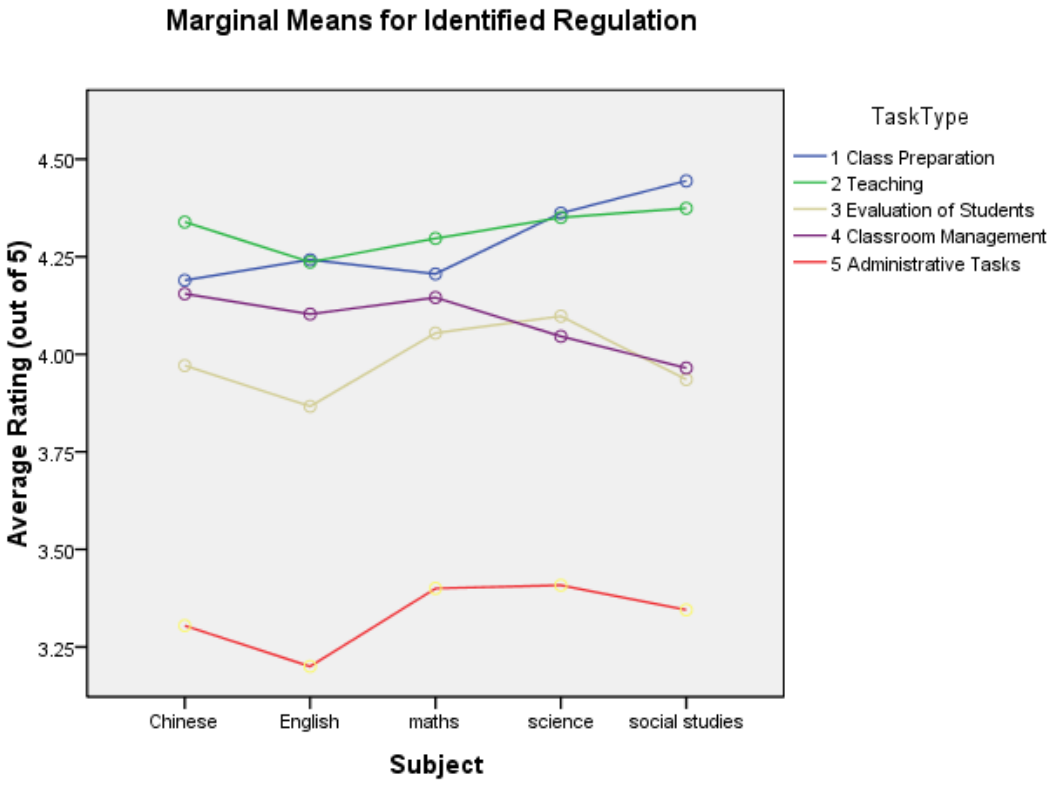
Two-Way Repeated Measures ANOVA for Subject Type and Task Type in Identified Regulation

Source	*df*	*F*	$\acute{\eta}^2$	*p*
		Between	Subjects	
Subject Type (S)	4	.57	.00	.68
		Within	Subjects	
Task Type (T)	4	216.75*	.43	.00
S × T	16	1.79*	.02	.02

Note. *$p < .05$.

In Table 4.6, the results again showed a highly significant main effect for task type, $F(4, 1112) = 216.75$, $p < .001$ and no significant main effect for subject, $F(4, 278) = .57$, $p = .68$. However, these main effects were qualified by a significant interaction effect, $F(16, 1112) = 1.79$, $p < .05$. Thus, tests of simple main effects were performed. The interactive relationship between the within-subject factor, task type and the between-subject factor, subject, is provided in Figure 4.2.

Figure 4.2



In view of so many small effects with the simple effects analysis, the main findings are given as follows, looking firstly at task type. Analysis of simple main effects reveals that there were significant differences for class preparation across subjects, $F(4, 278) = 2.39$, $p = .05$. Ratings for social studies were significantly higher than Chinese ($p < .05$), English ($p < .05$), and maths ($p < .05$). The data thus suggests that identified regulation appears to be most sensitive to teacher ratings of class preparation.

With regard to subject, there were significant effects across subjects. It is not surprising that, for all subjects, ratings for administrative tasks were the lowest (most *p's* < .001), as suggested by Figure 4.2. The results again indicate that, of five teaching tasks, teachers had the lowest level of identified regulation toward administrative tasks.

4.3.3 Subject and task difference in introjected regulation

Means for introjected regulation are provided in detail in Table 4.7.

Table 4.7

Mean and Standard Deviation Scores for Introjected Regulation

	Class preparation	Teaching	Evaluation of students	Classroom management	Administrative tasks
	M SD	*M SD*	*M SD*	*M SD*	*M SD*
Chinese	3.97 0.9	4.17 0.6	3.87 0.7	4.02 0.6	3.25 0.8
English	3.62 0.8	3.88 0.6	3.48 0.8	3.85 0.6	3.07 0.7
Maths	3.32 1.03	3.67 0.8	3.59 0.8	3.70 0.7	3.10 0.7
Science	3.80 0.7	3.77 0.9	3.50 0.9	3.79 0.7	3.08 0.8
Social studies	4.12 0.7	3.99 0.7	3.62 0.7	3.68 0.8	3.19 0.8
Total	**3.77** 0.9	**3.90** 0.7	**3.61** 0.8	**3.81** 0.7	**3.14** 0.8
	(3)	(1)	(4)	(2)	(5)

Note. The maximum mean for introjected regulation is 5, and the minimum mean is 1. Numbers enclosed in parentheses represent rankings.

According to the results in Table 4.7, teachers had especially low ratings for introjected regulation toward administrative tasks and relatively high ratings toward teaching. This trend is similar to that in Table 4.5. There also seems to be significant variation across subjects. Figure 4.3 supports this complicated relationship, where it appears that there are interactive effects between task type and subject.

In Table 4.8, the main effects of subject and task type on teachers' introjected regulation toward teaching tasks were computed using two-way ANOVA.

Table 4.8

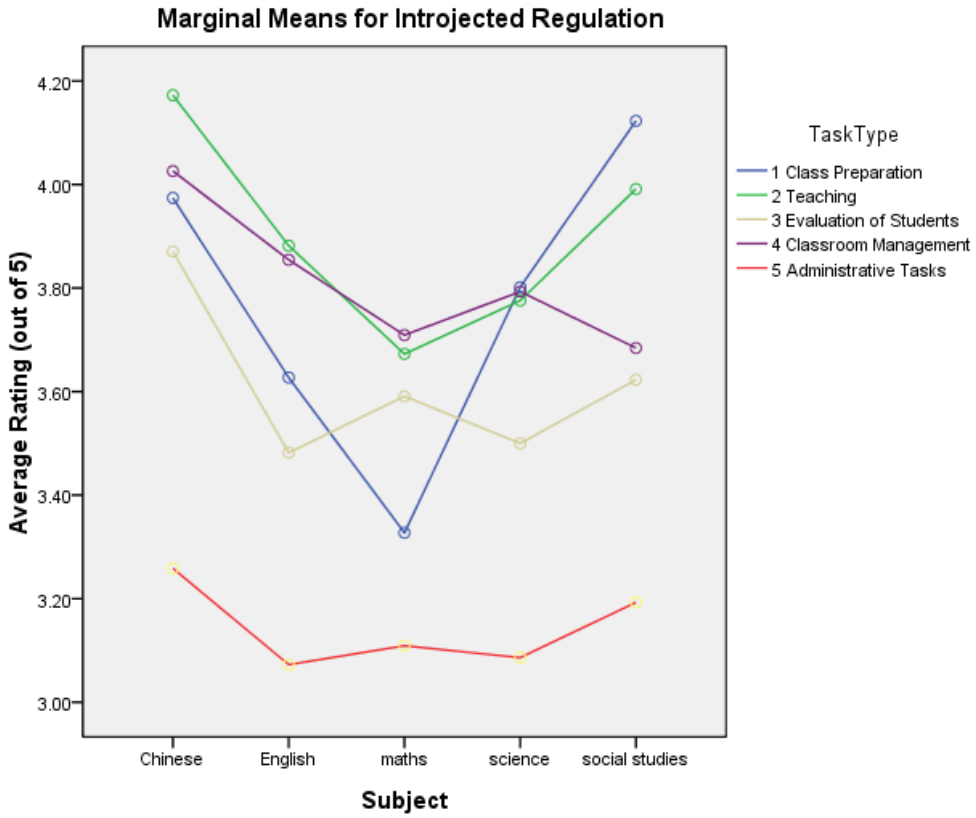
Two-Way Repeated Measures ANOVA for Subject Type and Task Type in Introjected Regulation

Source	*df*	*F*	$\acute{\eta}^2$	*p*
		Between	Subjects	
Subject Type (S)	4	3.31*	.04	.01
		Within	Subjects	
Task Type (T)	4	77.25*	.21	.00
S × T	16	3.21*	.04	.00

Note. *$p < .05$.

Examining the means in more detail confirms that the relationships were very complex. In Table 4.8, the results show a highly significant main effect for task type, $F(4, 1112) = 77.25$, $p < .001$, and a statistically significant main effect for subject, $F(4, 278) = 3.31$, $p < .01$. As expected, these main effects were qualified by a significant interaction effect, $F(16, 1112) = 3.21$, $p < .001$. Accordingly, tests of simple main effects were computed to examine differences in subject and task type. Figure 4.3 illustrates the interactive relationship between the within-subject factor, task type, and the between-subjects factor, Subject.

Figure 4.3



Given that there are so many small effects with the simple effects analysis, the main findings are provided as follows. Analysis of the simple main effects of task type demonstrates that there were significant differences for class preparation across subjects, $F(4, 278) = 7.03$, $p < .001$ and teaching, $F(4, 278) = 3.67$, $p < .01$. With respect to Class Preparation, ratings for maths were significantly lower than Chinese ($p < .001$), science ($p < .05$), and social studies ($p < .001$). Ratings for English were also lower than Chinese ($p < .05$) and social studies ($p < .05$). As for teaching, there was a similar but less pronounced pattern. Maths was again rated considerably lower than Chinese ($p < .05$) and social studies ($p < .05$). Similar to the results in class preparation, ratings for English were also lower than Chinese ($p < .05$), and ratings for Chinese were higher than maths ($p < .05$) and science ($p < .05$). The data thus suggests that introjected regulation is most sensitive to teacher ratings of class preparation and teaching. That is, maths and English teachers appear to be the least introjected toward class preparation. Also maths and science teachers seem to be the least introjected toward teaching, whereas Chinese teachers seem to be the most

introjected toward teaching.

With regard to analysis by subject, there were significant effects across all subjects. Consistent with Figure 4.1 and 4.2 (above), Figure 4.3 illustrates that ratings for administrative tasks were the lowest (most *p's* < .001), whereas ratings for teaching were again the highest ($p < .05$) , followed by class preparation ($p < .05$). The findings again show that administrative tasks were rated the lowest among five teaching tasks.

4.3.4 Subject and task difference in external regulation

Contrary to the first three types of motivation (intrinsic motivation, identified regulation, and introjected regulation), where there were significant interaction effects, there were no interaction effects for the last two types of motivation: external regulation and amotivation.

Table 4.9 illustrates the mean ratings for external regulation.

Table 4.9

Mean and Standard Deviation Scores for External Regulation

	Class preparation	Teaching	Evaluation of students	Classroom management	Administrative tasks
	M SD	*M SD*	*M SD*	*M SD*	*M SD*
Chinese	3.09 0.8	2.88 0.9	3.09 1.04	3.20 0.9	3.63 0.7
English	3.06 0.6	3.00 0.7	3.20 0.8	3.23 0.8	3.67 0.7
Maths	3.30 0.5	3.09 0.7	3.07 0.7	3.21 0.7	3.64 0.5
Science	3.02 0.7	2.90 0.9	2.97 0.9	2.98 0.8	3.56 0.8
Social studies	3.01 0.8	2.96 0.8	3.09 0.8	3.14 0.8	3.64 0.7
Total	**3.09** 0.7	**2.96** 0.8	**3.08** 0.8	**3.15** 0.9	**3.63** 0.8
	(3)	(5)	(4)	(2)	(1)

Note. The maximum mean for external regulation is 5, and the minimum mean is 1. Numbers enclosed in parentheses represent rankings.

As shown in Table 4.9, teachers had an especially high level of external regulation toward administrative tasks and a low level of external regulation toward teaching.

Table 4.10 shows the main effects of subject and task type on teachers' external regulation toward teaching tasks.

Table 4.10

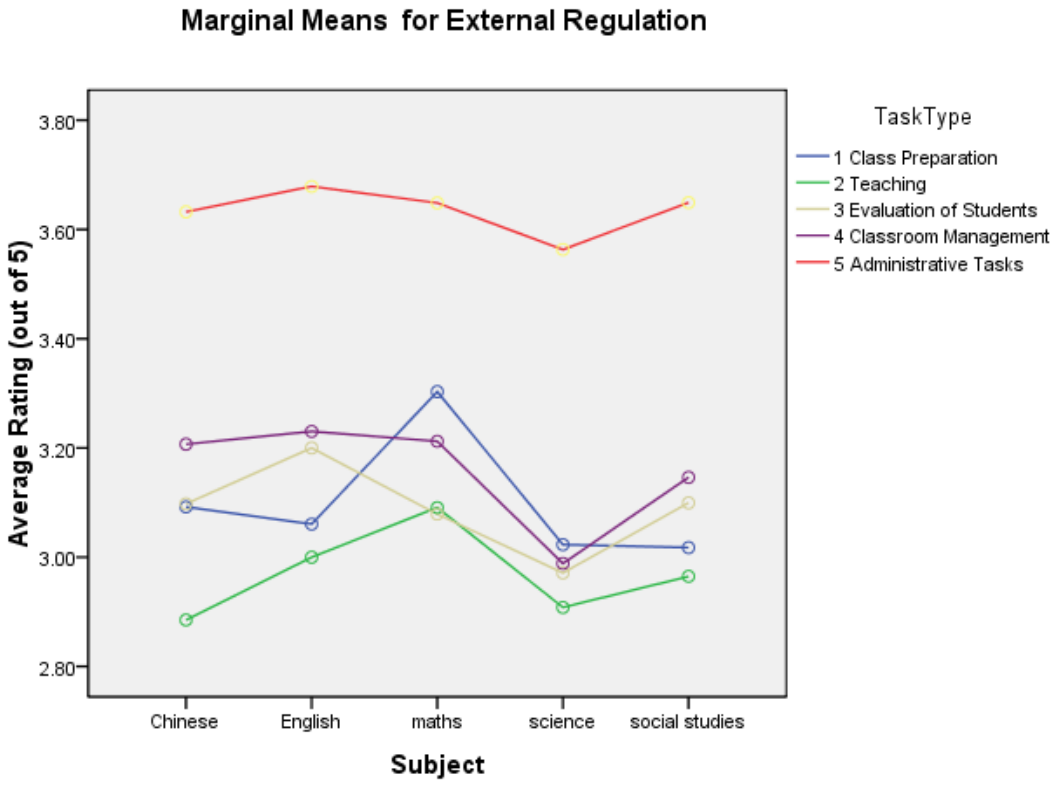
Two-Way Repeated Measures ANOVA for Subject Type and Task Type in External Regulation

Source	*df*	*F*	$\acute{\eta}^2$	*p*
		Between	Subjects	
Subject Type (S)	4	.52	.00	.72
		Within	Subjects	
Task Type (T)	4	73.79*	.21	.00
S × T	16	.90	.01	.56

Note. *$p < .05$.

According to the two-way ANOVA results in Table 4.10, there was a highly significant main effect for task type, $F(4, 278) = 73.79$, $p =< .001$, and no significant main effect for subject, $F(4, 278) = .52$, $p = .72$. There was no interaction between task type and subject, $F(16, 278) = 90$, $p = .56$. The results suggest that there were significant differences for external regulation in all five teaching tasks, as supported by Figure 4.4. Specifically, teachers showed a significantly higher level of external regulation for administrative tasks.

Figure 4.4



4.3.5 Subject and task difference in amotivation

Table 4.11 presents the means for Amotivation.

Table 4.11

Mean and Standard Deviation Scores for Amotivation

	Class preparation	Teaching	Evaluation of students	Classroom management	Administrative tasks
	M SD	*M SD*	*M SD*	*M SD*	*M SD*
Chinese	1.61 0.6	1.59 0.6	1.77 0.6	1.77 0.6	2.14 0.7
English	1.54 0.4	1.71 0.6	1.87 0.6	1.74 0.5	2.12 0.6
Maths	1.61 0.5	1.53 0.4	1.66 0.6	1.62 0.6	2.15 0.7
Science	1.45 0.5	1.42 0.5	1.60 0.6	1.62 0.7	2.00 0.7
Social studies	1.49 0.5	1.59 0.5	1.90 0.6	1.81 0.7	2.13 0.6
Total	**1.54** 0.5	**1.57** 0.5	**1.76**	**1.72**	**2.11**
	(5)	(4)	(2)	(3)	(1)

Note. The maximum mean for amotivation is 5, and the minimum mean is 1. Numbers enclosed in parentheses represent rankings.

The means in Table 4.11 illustrates that teachers had relatively high ratings for amotivation toward administrative tasks. This is similar to the pattern for external regulation in Table 4.9.

To examine further main effects of subject and task type on teachers' amotivation, a two-way ANOVA was computed. This is given in Table 4.12.

Table 4.12

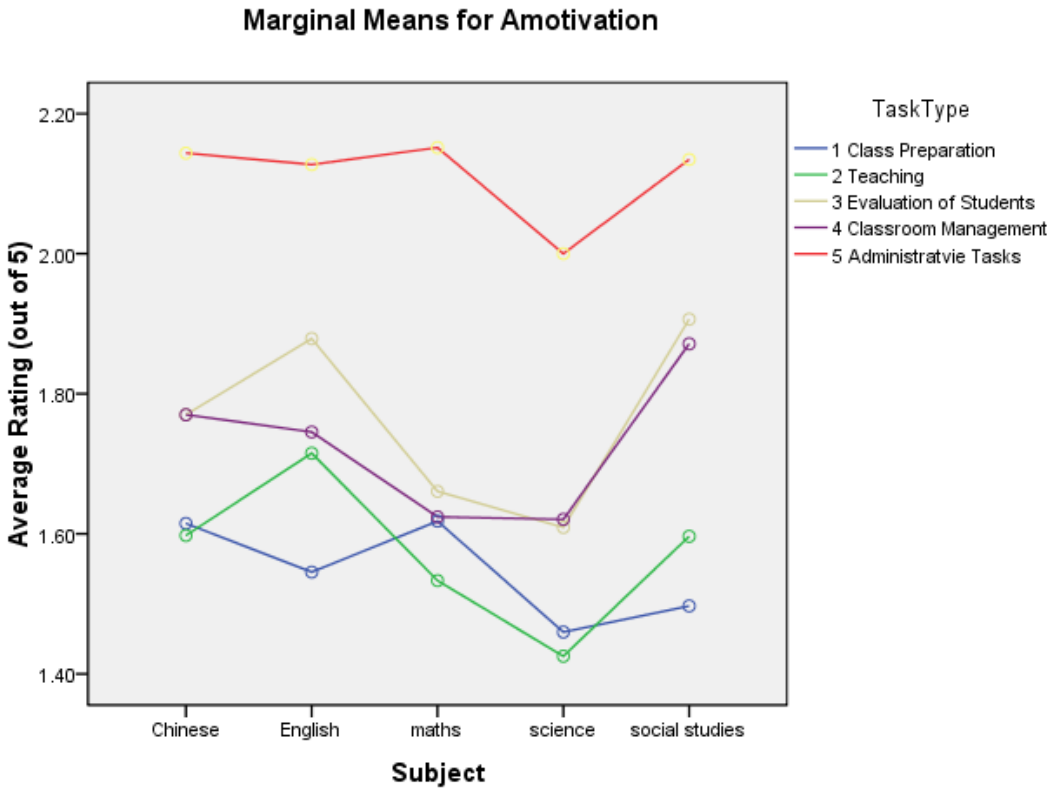
Two-Way Repeated Measures ANOVA for Subject Type and Task Type in Amotivation

Source	*df*	*F*	$\acute{\eta}^2$	*p*
		Between	Subjects	
Subject Type (S)	4	1.22	.01	.30
		Within	Subjects	
Task Type (T)	4	77.80*	.21	.00
S × T	16	1.45	.02	.10

Note. *$p < .05$.

Again, Table 4.12 shows that the main effect of subject was not significant $F(4, 278) = 1.22$, $p = .72$, but the main effect of task type was highly significant $F(4, 278) = 73.80$, $p < .001$. There was no interaction between task type and subject, $F(16, 278) = 1.45$, $p = .10$. The results suggest that there were significant differences for amotivation in five teaching tasks. Specifically, teachers had a significantly higher level of amotivation toward administrative tasks, as shown by Figure 4.5.

Figure 4.5



4.3.6 Effect size

The effect sizes for each of the two-way analyses were also calculated. As Olejnik and Algina (2000) propose, an effect size measure is especially important when sample sizes are large (as was the case in the present study) because "small differences can be statistically 'significant'" (p. 241). They also suggest using partial eta-squared ($\acute{\eta}^2$) to measure the size of treatment effect. For the three types of motivation that were significant across subjects, the effect sizes were as follows: intrinsic motivation for Task Type, $\acute{\eta}^2 = .48$, identified regulation for Task Type, $\acute{\eta}^2 = .43$, and introjected regulation for Subject and for Task Type, $\acute{\eta}^2 = .04$ and $\acute{\eta}^2 = .21$ respectively. Cohen (1988) suggests that values of .01, .06, and .14 be used to indicate small, medium, and large effects. Using these guidelines, the effect size for intrinsic motivation and identified regulation was large. For introjected regulation for Subject and for Task Type, it was medium and large respectively.

4.4 Overall summary

Despite the complex 5 x 5 ANOVA across the five dependent variables, several patterns emerged and are summarised as follows:

- In general, teachers had a relatively high level of autonomous motivation and a moderately high level of controlled motivation toward all five teaching tasks.
  - Of the five types of motivation, teachers had the highest level of identified regulation toward four of the teaching tasks, i.e., class preparation, teaching, evaluation of students, and classroom management. They also have a relatively high level of identified regulation toward administrative tasks.
  - Teachers had a higher level of introjected regulation than external regulation toward all teaching tasks except administrative tasks.
- As for subject differences, there were simple main effects for only three dependent variables, i.e., intrinsic motivation, identified regulation, and introjected regulation.
  - There were significant differences in intrinsic motivation toward classroom management across subjects. Social studies and science teachers were the least intrinsically motivated toward classroom management, whereas maths teachers were the most intrinsically motivated toward classroom management.
  - There were significant differences in identified regulation toward class preparation across subjects. Social studies teachers were the most identified with class preparation, while Chinese teachers were the least identified with class preparation.
  - There were significant differences in introjected regulation toward class preparation and teaching across subjects: (a) Maths teachers were the least introjected toward class preparation, whereas social studies teachers were the most introjected toward class preparation, and (b) maths teachers were again the least introjected toward teaching, whereas Chinese teachers were the most introjected toward teaching.
- There were significant differences for the five types of motivation in all five teaching tasks.
  - Teaching was rated the highest, and was followed by class preparation in

intrinsic motivation and identified regulation. In other words, teachers presented the highest level of intrinsic motivation and identified regulation toward teaching.

- Teaching was again ranked number one, followed by classroom management in introjected regulation. That is, teachers had the highest level of introjected regulation toward teaching.
- Administrative tasks was rated the highest in external regulation and amotivation. This suggests that the teachers were far more extrinsically motivated toward administrative tasks.

4.4.1 Hypotheses reviewed

The complex nature of the design made it difficult to develop specific analyses at the level of simple main effects. However, some broader-level hypotheses were made and the following details how these hypotheses are confirmed or not.

- The finding that there were no significant differences in intrinsic motivation across subjects toward class preparation and teaching contrasted with Hypothesis 1.
- The finding that there were no significant differences in external regulation across subjects toward class preparation and teaching contrasted with Hypothesis 2.
- The finding that there were no significant differences in introjected regulation across subjects toward classroom management contrasted with Hypothesis 3. However, the finding that there were significant differences in introjected regulation across subjects toward class preparation confirmed Hypothesis 3. It must be noted that the finding showing that there were significant differences in introjected regulation across subjects toward teaching was not expected in Hypothesis 3.
- The finding that teachers were most intrinsically motivated for teaching, followed by class preparation was in line with Hypothesis 4.
- The result that Teaching was rated the highest in identified regulation, followed by classroom management and class preparation confirmed Hypothesis 5.
- The finding that ratings for teaching were the highest in introjected regulation, followed by classroom management confirmed Hypothesis 6.

- As hypothesised in Hypothesis 7, teachers were least motivated by undertaking administrative tasks. Ratings for administrative tasks were rated the lowest in intrinsic motivation, identified regulation, and introjected regulation. In contrast, ratings for administrative tasks were the highest for external regulation and amotivation.

4.4.2 Certain issues needing further explanation

An analysis of the data provided in the questionnaires reveals that certain issues need further investigation and explanation. For example, there were inconsistencies in teachers' intrinsic motivation, external regulation, and introjected regulation toward teaching between the findings and hypotheses. That is, findings that there were no significant differences in intrinsic motivation and external regulation toward teaching across subjects contrasted with Hypotheses1 and 2. Besides, findings that there were significant differences in introjected regulation toward teaching across subjects were not expected in Hypothesis 3.

With regards to research question 2: Are there differences between subject specialists in regard to teacher motivation toward teaching tasks? There were generally no significant differences by subject. This finding was highly unexpected especially as the main reason for the study was the anecdotal experience that subject seemed to be a key reason/factor why teachers differed in their motivations. So, if it wasn't the subject type that was a possible reason for differences in motivation, what other factors might have been important? A review of the literature suggested that teachers' thoughts and ideas about the nature and purpose of teaching might have been important.

A review of the literature on teachers' thoughts on teaching shows that teachers' conceptions of teaching aims to explore qualitatively different ways in which teachers perceive, experience, and comprehend their teaching. The researcher then developed an interview schedule based on the five dimensions of conceptions of teaching proposed by Kember (1997), from which teachers construct their conceptions of teaching. It was hoped that the interview data of teachers' conceptions of teaching and learning could provide a clearer answer to the question that the research was addressing. Thus, interviews were conducted with thirty teachers, who had participated in the survey questionnaire, to elicit information about the unexpected findings of teaching and to deeply probe their conceptions and ideas about teaching.

Chapter 5

Discussion of Quantitative Findings

This chapter discusses the results from the quantitative findings in the following sequence: (1) teacher motivation toward teaching tasks by subject type and task type, (2) differences between subject type in regard to teacher motivation toward teaching tasks, (3) differences between task type in regard to teacher motivation toward teaching tasks, and (4) a brief conclusion of the discussion.

5.1 Teacher motivation toward teaching tasks

The results of the analysis indicate that, in general, all teachers had a relatively high level of autonomous motivation and a moderately high level of controlled motivation toward the five teaching tasks. More specifically, they had a relatively high level of identified regulation toward four of the teaching tasks: class preparation (M = 4.28), teaching (M = 4.31), evaluation of students (3.98), and classroom management (M = 4.08). Additionally, they had a moderately high level of identified regulation toward administrative tasks (M = 3.33) (see Table 4.1, p. 70). These findings are contrary to the expectations mentioned in Chapter 1, that high school teachers in Taiwan might suffer from low levels of motivation due to educational reforms and social and political changes in recent years.

The results are similar to those of the previous studies undertaken in Taiwan, in which teachers had a relatively high degree of satisfaction with their jobs (S. F. Chen, 1999; Fwu & Wang, 2002; Xie, 1996; Zhuang, 1998). Nevertheless, the results contradict the findings of previous studies in other countries. For example, in Portugal, elementary and high school teachers suffered from a greater lack of motivation than any other group of professionals (Kyriacou, 1987; Lens & Jesus, 1999; Pithers & Fogarty, 1995; Prick, 1989). Furthermore, in India, primary school teachers were found to be demotivated due to the complexities of the education system (Ramachandran, 2005).

The finding that teachers had a relatively high level of autonomous motivation toward the five teaching tasks could be explained by the culture in Taiwan. In Chinese society there are three philosophies (Taoist, Buddhist, and Confucian) that permeate

daily life. Among them, Confucian had the most profound influence on education. Confucius considered that education was crucially important for personal development (transformation of a person's personality or character), and for social development (educating an elite class of scholars and rulers for the service of the society) (Gao, 1998; Pratt, 1992a).

Another great influence on education is the establishment of the "Ke Ju" system, a system of public examination, in 606 A. D. (during the Sui Dynasty) (Gao, 1998). From then on, schooling has become the official ladder by which to reach the top of society. Today, although education in Taiwan has shifted from something intended for the reproduction of a scholar class to the production of a well-educated, highly literate, and competitive workforce, education is still perceived by the general public as an important means to acquire socio-cultural and economic capital for the common citizen.

In addition, Chinese society is dominated by a collectivism that emphasises traditional Chinese philosophical ideas such as duty, ethical conduct, public benefit, social responsibility (Zhang, 1988), "the priority of group goals over individual goals", and values that promote the welfare of groups (Triandis, McCusker, & Hui, 1990, p.1006). Under the influence of such a culture, Taiwanese teachers today may still be fully aware of the high expectations that the public, parents, and society have on them, and of the vital role that they play, not only in the transmission of traditional values, but also in the preparation of children for their future occupational roles.

Consequently, Taiwanese teachers may strongly identify with the meaningfulness and value of their job, and such identification will enhance their autonomous motivation. Ellemers et al. (2004) propose that employees can enhance their work motivation if they identify with the group or the group's goal. This is also congruent with theoretical postulations of self-determination theory (SDT): when people identify with a value, they will consciously regulate their behaviour and gradually transform their external regulation into true self-regulation, which in turn promotes self-determined motivation.

The finding that teachers had a moderately high level of introjected regulation toward the five teaching tasks could also be explained by traditional Chinese culture in Taiwan, especially Confucian influence. Instead of seeking to increase people's

knowledge of facts, as stressed by Western philosophy, Confucius sought to elevate the mind and strive for higher moral values. Confucius stressed the importance of the exemplary effects of teachers. For example, he said "when the personal conduct of a man is upright, the people will be attentive even if he does not issue orders; however, if his personal conduct is not upright, even if he issues orders they will not be followed" (The Analects, Book XIII Tsze-Lu)[1]. Traditionally, teachers have thus been viewed as models of good conduct and learning for students (Gao, 1998).

Such a long-standing tradition has placed teachers in positions of moral responsibility: moulding the social nature of their students is as important as developing areas of knowledge or performance (Pratt, 1991, p. 306). It is not surprising that Taiwanese teachers, who are products of a cultural tradition based on Confucianism, may follow Confucianism unconsciously and view themselves as role models both academically and behaviourally.

Accordingly, despite the fact that they are under a great amount of pressure from student records in the Joint College Entrance Examination, and from unfavourable circumstances due to changes in social and community values, a poor image of teaching (Fwu & Wang, 2002), political demands, and educational reforms (B. C. Chen, 1999; Li, 2012; Pan, 2011), they may still dedicate themselves to all the teaching tasks in order to present themselves as role models for students to follow. If they fail to do so, they might be vulnerable to Chinese cultural conceptions of shame and face (Gao, 2008).

The finding that teachers also had a moderately high level of controlled regulation toward the five teaching tasks could be largely explicable by favourable working conditions. Unlike most Western countries, in which teachers are not offered a high salary or the compensation of high social status (Richardson & Watt, 2010), Taiwanese teachers may value the rewards of a generous compensation package: free health and life insurance, low-interest housing loans, paid maternity leave, subsidised education for their children, a government-funded pension (Wang, 2004), respect from community, and high social status (Fwu & Wang, 2002). Additionally, these teachers may think of the school environment in Taiwan today as a relatively safe place in comparison with schools in some other countries (Wang, 2004).

[1] The Analects (論語) will be referred to as AN in this study.

In brief, the importance of education in the Chinese tradition, the exemplary effects of teachers in the Confucian culture, and the favourable working conditions in Taiwanese society may account for Taiwanese teachers' relatively high level of autonomous motivation, and their moderately high level of controlled motivation, toward five teaching tasks.

It was found that, of the five types of motivation, teachers had the highest level of identified regulation toward four teaching tasks: class preparation, teaching, evaluation of students, and classroom management. They also had a relatively high level of identified regulation toward administrative tasks. This could be explained by the view that it is more important for people to identify with the value of activities than to have their intrinsic interest in the activities, which Koestner (2002) proposes. That is, Taiwanese teachers may identify the value and meaningfulness of these four teaching tasks because they have a close relationship with students' academic performance. More importantly, their students' academic performance in the school has a lot to do with whether students can pass the Joint College Entrance Examination and enter a good university.

Such a possible explanation may be supported by Koestner's (2002) following statement: "it is likely that the extent to which individuals have consciously integrated the value of domain-relevant activities into their personal goals and values will be more important than their intrinsic interest in the domain" (p. 114). This is because people "who are highly identified toward a given domain are likely to persist at even the uninteresting activities within the domain". In contrast, there is a risk that someone "whose regulation is exclusively based on intrinsic motivation will invest themselves only in those domain-relevant activities that are interesting to them" (Koestner, 2002, p. 114).

The above-mentioned argument may explain why Taiwanese teachers had the highest level of identified regulation toward four teaching tasks but not administrative tasks. To sum up, although teaching has become more challenging, demanding, and stressful for teachers in recent years, these teachers still identify with the value of education and the importance of teaching to the success of their students' future.

5.2 Differences between subject types in regard to teacher motivation toward teaching tasks

The results of the two-way ANOVA that examined differences between teachers across subjects in regard to teacher motivation show a significant effect of subject type on only three dependent variables: intrinsic motivation, identified regulation, and introjected regulation. The following sections discuss significant differences in intrinsic motivation, identified regulation, and introjected regulation across academic subjects.

5.2.1 Subject differences in intrinsic motivation

Contrary to the hypothesis that Chinese, English, and social studies teachers would have a higher level of introjected regulation toward classroom management than maths and science teachers, the results reveal that classroom management showed a significant difference in intrinsic motivation between subject specialists. More specifically, social studies teachers were the least intrinsically motivated toward classroom management, whereas maths teachers were the most intrinsically motivated toward classroom management.

This finding is similar to Bishay's (1996) study, which found that mathematics teachers had a significantly higher level of enjoyment, happiness, challenge, skill, involvement, and sociability than their humanities counterparts in response to different teaching activities. This could be explained by three factors: 1) schools prioritised mathematics and science, 2) greater resources were assigned to these areas, and 3) positive public perception of the importance of mathematics and science both inside and outside of the school (Bishay, 1996).

In this study, Taiwanese maths teachers and social studies teachers at senior high schools also show a similar tendency. From my personal experience, maths teachers tend to deal with students' problems easily and effectively (both inside and outside the classroom) and enjoy the challenge posed by students in comparison with social studies teachers.

One possible reason is that the nature of the knowledge of mathematics and social studies may influence the way teachers perceive and deal with phenomena. Maths teachers may be likely to view things from a simplified and quantitative perspective, to treat classroom affairs and students' behavioural problems based on

facts, and to manage them rationally. For these possible reasons, they may not feel stressed or burdened. In contrast, social studies teachers may perceive things from a complicated and qualitative stance, and tend to be concerned with particulars. They may be likely to think that classroom management is a hard job and that they sometimes feel helpless in the face of students' behavioural problems.

However, the finding that there was no significant difference for intrinsic motivation in teaching across subjects contradicts the findings of the previous two studies (e.g., Biglan, 1973b; Smedy, 1996). For instance, Biglan (1973b) and Smedy (1996) found that teachers in hard pure areas generally manifested a weaker commitment to teaching, whereas teachers in social sciences revealed a more personal commitment to teaching and students. These findings will be further explained in the qualitative part of the study.

5.2.2 Subject differences in identified regulation

The hypotheses that subject specialists would have different levels of intrinsic motivation and external regulation toward class preparation were not supported. The results indicate that there was only a significant difference in identified regulation across subjects toward class preparation. To put it precisely, social studies teachers were the most identified with class preparation while Chinese teachers were the least identified with class preparation.

A feasible explanation is that the government in Taiwan implemented curriculum reforms, such as "95 Temporary Curriculum Guidelines", that have changed the content and structure of knowledge across disciplines. Just as Bernstein (1971) notes that both a discipline's classification and its framing basically reflect power relationships, the content and structure of knowledge in every discipline have undergone significant change due to political changes in Taiwan.

Take history for example: Clark (1996b) notices that history, as a discipline, has been constantly expanding to cover "more eras, locales, and activities" (p. 420). This is also true for the content and structure of history textbooks for senior high school students in Taiwan. For example, writers of history textbooks have changed the ratio of the content of Chinese history and Taiwanese history. These changes are likely to force teachers of social studies to be aware of the importance of preparing their lessons.

Nevertheless, the content and structure of knowledge presented in Chinese textbooks have not changed to the same extent as those of history or geography. It follows that Chinese teachers may be quite familiar with a large portion of Chinese classic literature and they may not perceive class preparation to be as important as social studies teachers' perception of it.

In short, it is curriculum reforms and the nature of knowledge in social studies and Chinese that may account for differences in identified regulation toward class preparation between social studies teachers and Chinese teachers.

5.2.3 Subject differences in introjected regulation

As stated in Hypothesis 3, significant differences in introjected regulation across academic subject areas were found in class preparation. To be specific, social studies teachers were the most introjected toward class preparation, while maths teachers were the least introjected toward class preparation. Again this could be explained by differences in the nature of knowledge between social studies and maths. As mentioned above, the content and structure of knowledge in social studies have undergone great changes in the past two decades. Hence, social studies teachers may feel bad or guilty if they do not prepare lessons well. Nevertheless, the content and structure of knowledge in maths have remained almost the same. It follows that maths teachers may not need to make as much effort to prepare lessons as teachers of social studies. This possible reason may explain the results that social studies teachers were the most introjected toward class preparation, whereas maths teachers were the least introjected toward class preparation.

The finding that there were significant differences in introjected regulation toward teaching across subjects is again contrary to expectation. More specially, Chinese teachers were the most introjected toward teaching, whereas maths teachers were the least introjected toward teaching. Again, this could be attributed to differences between Chinese and maths in the nature of the knowledge, which could affect their conceptions of teaching as well as their attitude toward it. For Chinese teachers, their role is not only the transmission of knowledge in the textbooks, but also the transmission of cultural values. For example, in Confucian writings, teachers and parents should lead students and children by 'personal example as well as verbal instruction'. It is reasonable that Chinese teachers tend to emphasise the importance

of a role model for students to follow when teaching. If they failed to do so, they could be more vulnerable to losing face and feeling guilty. It is because they may be deeply influenced by the Chinese cultural conceptions of shame and face (Gao, 2008)

In contrast, the nature of knowledge in pure hard areas is concerned with "quantities, impersonal, value-free, clear criteria for knowledge verification" (Becher, 1989, p. 36). For example, maths is concerned with "shape, space, measures, figures, definite answers, no personal element" (Bolden, Harries, & Newton, 2010, p. 150). Maths teachers thus tend to emphasise neutral, value-free knowledge, and have clear criteria for knowledge. For this reason, they may be less vulnerable to cultural conceptions of shame and face as well as cultural expectations. In brief, it is logical that Chinese teachers may be under much greater pressure and feel more guilty than maths teachers if they fail to set a good example as teachers.

5.3 Differences between task types in regard to teacher motivation toward teaching tasks

The results of the two-way ANOVA that examined the difference in teaching tasks in regard to teachers' motivation show a significant effect of task type on five dependent variables: intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation.

Given that there are many small differences, the main differences are discussed in the following sequence: (1) teaching was ranked first in intrinsic motivation, identified regulation, and introjected regulation, (2) administrative tasks were rated lowest in intrinsic motivation, identified regulation, and introjected regulation, but highest in external regulation and amotivation, and (3) classroom management was ranked second highest in introjected regulation in terms of type of motivation and type of task.

5.3.1 Teaching ranked first in intrinsic motivation, identified regulation, and introjected regulation

The hypotheses that teaching would be experienced as more intrinsically motivated, more identified regulated, and more introjected regulated than the other four task types by the respondents were fully supported. In the present study, teaching was ranked first in intrinsic motivation, identified regulation, and introjected

regulation, indicating that teachers might perceive teaching as the most important task among the five teaching tasks.

These results are in line with those of three other studies. Bishay (1996) found that teachers felt best when they were teaching. Dinham and Scott (1996a, 1996b, & 1998) showed that primary and secondary school teachers in UK and Australia were most satisfied with matters intrinsic to the role of teaching, including facilitating student achievement, helping students modify their attitude and behaviour, and building positive relationships with students and others. Scott et al. (1998) revealed that English teachers in the UK were most satisfied with core business of teaching.

This study's findings are also supported by two other studies. Barnabe and Burns (1994) found that teahcers in Quebec viewed their profession as a more meaningful and valuable job than other professionals did their careers. Richardson and Watt (2006) reported that Australian student teacher chose teaching as their career largely because of the intrinsic value of teaching.

The following sections discuss possible reasons for these findings.

5.3.1.1 Teaching ranked first in intrinsic motivation

A feasible explanation for teachers' high levels of intrinsic motivation toward teaching could be that teaching itself is required for the level of challenge, concentration, and control that seem to be the most 'psychologically rewarding' (Bishay, 1996). Namely, the optimal challenge of teaching allows teachers to enjoy teaching to the fullest and thereby experience the attainment of 'flow', as proposed by Csikszentmihalyi (1990). This leads to the fulfilment of higher-ordered needs for actualisation (Maslow, 1954), growth (Alderfer, 1972), and achievement (McClelland, 1971). Briefly, teaching enables teachers to have feelings of personal accomplishment conducive to teacher intrinsic motivation.

Another reason could be that teachers have greater control over their own teaching (Dinham & Scott, 1998). Teaching is a job with a high degree of autonomy and responsibility, which leads to particular psychological states conducive to high work motivation (e.g., Hackman & Oldham, 1975, 1980). In other words, teaching enables teachers to experience volition and perceive locus of causality from external

to internal (De Charms, 1968; Heider, 1958), and in turn experience greater autonomy satisfaction, which, as suggested by SDT, increases intrinsic motivation.

Still another possible reason is that teachers have considerable expertise, such as subject-matter and pedagogical knowledge, which enables them to experience a sense of competence similar to self-efficacy (Baudura, 1986). Feelings of competence can enhance intrinsic motivation, as suggested by Cognitive Evaluation Theory (Deci & Ryan, 2000). This postulation is supported by some empirical studies. For example, research has demonstrated that teachers with a high sense of efficacy enjoyed teaching (Watters & Ginns, 1995), and had greater levels of enthusiasm for teaching (Allinder, 1994; Guskey, 1984; Hall et al., 1992) as well as stronger commitment to teaching (Coladarci, 1992; Evans & Tribble, 1986).

In short, teaching allows teachers to experience enjoyment, perceive autonomy, and realise their abilities to the fullest and this enhances their intrinsic motivation.

5.3.1.2 Teaching ranked first in identified regulation

The finding that teachers had a significantly high level of identified regulation toward teaching may be attributed to three factors: task significance (Grant, 2008), social utility value (Wigfield & Eccles, 1992; Richardson & Watt, 2006), and social cues (Salancik & Pfeffer, 1978).

In the Chinese tradition, education has been viewed as crucially important for personal and social development (Gao, 1998). This is also true for education today in Taiwan: education is still regarded as an important and effective means to raise one's social and economic status, and to further promote national economic development. Success in schooling, especially if one can pass the Joint College Entrance Examination and then graduate from a good university, implies that one should expect a better career and high income.

For this reason, Taiwanese teachers may perceive teaching as high in task significance and view their job as meaningful. This may lead them to hold the view that teaching allows them to shape the future of children and adolescents and to make a social contribution (Richardson & Watt, 2006; Wigfield & Eccles, 1992). This is consistent with the findings of two other studies. Barnabe and Burn (1994) revealed that task significance presented the highest level of motivation for Quebec's teachers

to do their jobs. Gagne et al. (1997) found that the more meaningful the work was perceived to be, the more intrinsically motivated employees felt.

In addition to the value of task significance and social utility for teaching, informational cues from the social environment also play a pivotal role in shaping teachers' perceptions of teaching. As mentioned above, Chinese society is dominated by collectivism, which emphasises group goals over individual goals. Such tradition may lead Taiwanese teachers to be aware of high expectations from parents and society, and therefore identify the importance of "the core business of teaching – the facilitation of pupil development and learning" (Scott et al., 1998, p. 22). These expectations and values may be conducive to teachers' strong commitment to teaching.

Briefly, Taiwanese teachers' perception of the meaningfulness of teaching, the importance of teaching to students and society, and the expectations of parents and society may foster their identification with the values of teaching.

5.3.1.3 Teaching ranked first in introjected regulation

Teachers' high levels of introjected regulation toward teaching could be explained by 'a noisy ego' from the perspective of SDT (Niemiec et al., 2008). A noisy ego, which is closely associated with the regulation of behaviour through introjections, manifests in ego-involvement, public self-consciousness, and contingent self-esteem. Ego-involvement refers to the success or failure of a task as an indicator of self-worth (Nicholls, 1984; Ryan, 1982). Public self-consciousness concerns people's inclination to be aware of themselves as objects of others' observation (Niemiec et al., 2008). Contingent self-esteem means one's self-esteem is based on external indicators such as accomplishment, appearance, or status (Deci & Ryan, 1995). Namely, the pursuit of one's self-esteem is obtained from experiences with relational others (Ryan & Brown, 2003).

Taiwanese teachers tend to have a 'parental directing' style of teaching (Gao, 1996), and may regard their students' achievements as their own achievements, and their students' conduct as the outcome of their guidance, i.e., ego-involvement. In addition, under the influence of Chinese tradition and culture, Taiwanese teachers may tend to care for how the general public perceives themselves. That is, they may have the idea of 'public self-consciousness' or 'public self' in their mind – the ways

in which a person thinks others perceive him (Baumeister, 1986). It follows that if their students have poor academic performance or unacceptable behaviour, then teachers could lose face. Conversely, students' successful academic performance or good behaviour could imply that their teachers could gain face: Ho (1994) points out that one can gain face through the achievement of significant others.

According to Huang (1987), "face is a sense of worth that comes from knowing one's status and reflects concern with the congruency between one's performance or appearance and one's real worth" (p. 71). Although the concept of face is not exclusive to China, it is more deeply embedded in Chinese culture because sense of shame (耻) has been emphasised in Chinese society (Eberhard, 1967). For the Chinese, losing face has been thought to bring serious implications for self-esteem (Huang, 1987).

Another factor that makes Taiwanese teachers more vulnerable to feeling shame for failure may lie in the concept of the role model. In traditional Chinese culture, teachers were listed among the five categories of being who should be respected by society (the God of Heaven, the God of the Earth, the emperor, parents, and teachers [Zhou, 1988]). As a result, they are "under a great burden to conform to society's moral norms" if they fail to set a role model for their students (Schoenhals, 1993, p. 199). Under the influence of traditional Chinese culture, Taiwanese teachers today may be either fully conscious or unconscious of how the general public perceives them and they might lose face if their students' academic performance does not meet the high cultural expectations.

To sum up, the concept of face and shame in Chinese culture is conducive to 'a noisy ego' and may account for the high level of introjected regulation toward teaching among Taiwanese senior high school teachers.

5.3.2 Administrative tasks ranked lowest in intrinsic motivation, identified regulation, and introjected regulation

As hypothesised, administrative tasks were rated lowest in intrinsic motivation, identified regulation, and introjected regulation, but highest in external regulation and amotivation. This finding indicate that teachers were far more externally regulated when doing administrative tasks, and is consistent with three previous studies.

Sergiovanni (1967) and Dinham (1992) reported that administration and administrative responsibilities were dissatisfying for teachers. Bishay (1996) revealed that teachers across academic subjects felt bored during 'faculty meetings'.

One possible reason for a low level of autonomous motivation and high level of external regulation toward administrative tasks is that teachers have less control over administrative tasks than the other four teaching tasks. For example, teachers generally lack opportunities to participate in decision-making about administrative tasks. That is, administrative tasks generally have something to do with a principal or administrator who usually imposes restrictions on teachers and allows little space for self-determination (Deci & Ryan, 1985a).

In addition to this, problems or frustrations with a variety of administrative routines, increasing paperwork, and poor communication channels with administrative personnel (Zembylas & Papanastasiou, 2004) are probably conducive to teachers' feeling of helplessness when performing administrative tasks (Deci & Ryan, 1985a; Deci & Ryan, 2008). These circumstances may decrease teachers' feelings of autonomy and intrinsic motivation (Deci & Ryan, 1980). It follows that teachers are likely to do administrative tasks in order to satisfy external demands (Deci & Ryan, 2002).

Another possible reason is that Taiwanese teachers may perceive they are less capable of undertaking administrative tasks. It is because administrative tasks are commonly concerned with educational policies and educational reforms, which often demand teachers to learn new skills. However, from my experience, the educational authorities concerned have not provided appropriate training programmes to accompany these educational reforms. Practising teachers may thus be forced to learn how to undertake such tasks by trial and error, which will undermine their autonomous motivation toward administrative tasks.

Still another possible reason is that teachers may not view administrative tasks as important and meaningful as the other four teaching tasks. It may be because administrative tasks themselves are uninteresting and have little to do with students' academic performance. Teachers may thus have less intention to carry out administrative tasks and may be unwilling to give much time and energy to perform them.

In short, the fact that teachers feel less autonomous and competent when taking on administrative tasks, and that administrative tasks have little to do with students' academic performance, may explain teachers' low level of autonomous motivation and high level of controlled motivation toward administrative tasks.

5.3.3 Classroom management ranked second highest in introjected regulation in terms of type of motivation and type of task

As stated in Hypothesis 6, classroom management ranked second highest in introjected regulation in terms of type of motivation as well as type of task. This result indicates that these teachers might see classroom management as closely related to students' academic performance as teaching.

A feasible explanation is that senior high school students in Taiwan have to spend eight hours per day sitting in the same classrooms for lessons. If teachers cannot keep their classrooms in order, students may not be attentive in class, teachers may not teach effectively, and eventually students may show poor academic performance in school and in the Joint College Entrance Examination. That is, teachers may be fully aware of the importance of classroom management to their students' learning and try to do their utmost to manage order. However, carrying on this task does not intrinsically motivate them. If they failed to manage their class, they could feel guilty about their negligence and irresponsibility. Briefly, the current educational situation today in Taiwan may be a contributing factor to teachers' high level of introjected regulation toward classroom management.

5.4 Conclusion

Overall, the discussion indicates that Taiwanese senior high school teachers' relatively high level of autonomous motivation and moderately high level of controlled motivation toward teaching tasks are primarily products of some relational configuration that includes cultural, social, political, and psychological factors.

More specifically, the finding that Taiwanese teachers had a relatively high level of identified regulation, and a moderately high level of introjected regulation toward all teaching tasks other than administrative tasks, helps us to realise that teachers' work motivation is context-dependent. This implies that while some kinds of teacher motivation may be consistent across contexts, others may vary with

differences in context, such as social and cultural background, subject area, and task domain.

For example, the complexity and affluence of Chinese culture and society may be closely related to the way that Taiwanese teachers think about themselves and the way that they act in teaching practices. Namely, the emphasis on teachers' exemplary effects, the importance of education, the high expectations of society and parents, favourable teaching conditions, and the conception of shame and face in Chinese culture and society may all be conducive to Taiwanese teachers' relatively high level of identified regulation and a moderately high level of introjected regulation toward the four teaching tasks: classroom preparation, teaching, evaluation of students, and classroom management.

Apart from social and cultural factors, subject area also affects Taiwanese teachers' level and type of motivation toward teaching tasks. The finding that there were significant differences in intrinsic motivation, identified regulation, and introjected regulation toward certain teaching tasks across subjects indicates that the nature of knowledge in different disciplines and political influences on the content and structure of knowledge in history and geography may have an implicit influence on how teachers perceive themselves and events around them, and on how they deal with classroom affairs and students' behavioural problems.

Moreover, task domain plays a significant role in the teachers' level and type of motivation toward teaching tasks. The finding that there were significant differences in the five types of motivation toward the five teaching tasks among Taiwanese teachers indicates that there were variations and fluctuations in teachers' motivation across different tasks. One possible explanation could be task significance, i.e., importance and meaningfulness of individual teaching tasks. Another could be explained by differences in teachers' feelings of accomplishment, autonomy, and competence when performing different tasks.

To sum up, Taiwanese teachers' motivation toward teaching tasks is complex and affected by many different interrelated factors, which include psychological elements, Chinese culture, society, politics, and working conditions. Among these factors, psychological elements, which are influenced by proximal factors like

working conditions and by distal factors like Chinese culture, society, and politics, may be at the core of Taiwanese teachers' motivation toward teaching tasks.

Chapter 6

Literature Review: A Qualitative Study

This chapter reviews extant literature on conceptions of teaching related to this study in the following sections:

i) The importance of conceptions of teaching
ii) Studies of conceptions of teaching and learning
iii) Studies of conceptions of teaching and learning in terms of epistemological beliefs
iv) The relationship between conceptions of teaching and teaching strategies
v) Subject differences in conceptions of teaching and learning
vi) The role of the teacher

6.1 The importance of conceptions of teaching

Conceptions of teaching that are held by teachers cannot be overlooked because there is a connection between what teachers think and how they act (e.g., Bandura, 1986; Clark & Peterson, 1986; Pratt, 1992). A great number of studies have shown that there are relations between teachers' conceptions of teaching and learning and their approaches to teaching (e.g., Donche & Van Petegem, 2011; Kember, 1997; Lindblom-Ylänne et al., 2006; Trigwell & Prosser, 1996a, 1996b). More importantly, conceptions of teaching and learning that are held by teachers have an influence on students' perceptions of the learning environment, which in turn affects student learning approach and subsequently the quality and outcome of student learning (Kember & Gow, 1994; Kember, 1997; Trigwell et al., 1997; Trigwell et al., 1999).

Teachers' beliefs, conceptions and related practises also play a pivotal role in the context of educational change (Calderhead, 1996; Clark & Peterson, 1986; Fullan, 1982). For example, some studies demonstrate that teachers' beliefs and conceptions can be barriers to curricular reforms because their nature claims to be stable or resistant to change (Kagan, 1992; Nettle, 1998; Pajares, 1992). Accordingly, to better understand why teachers teach the way they do, and why they may be resistant to change, some researchers have called for an investigation into the conceptions

teachers hold (e.g., Van Petegem & Donche, 2008).

6.2 Studies of conceptions of teaching

A substantial body of earlier research on beliefs about teaching of school teachers was conducted before the 1980s (see Clark & Peterson, 1986; Pajares, 1992). In the early 1990s, noting that research into student learning had brought to light a relationship between student conceptions of learning, learning approaches, and learning outcomes, a number of researchers (e.g., Dunkin & Precians, 1992; Dunkin, 1990; Fox, 1983; Hewson & Hewson, 1987; Prosser et al., 1994; Samuelowicz & Bain, 1992) began to carry out studies examining beliefs about teaching of university academics (Kember, 1997).

Although the term 'beliefs' about teaching has diverse potential meanings (such as orientations, conceptions, beliefs, approaches, and intentions), the term 'conceptions' of teaching is the most common (Kember, 1997). Pratt (1992a) provides a definition of 'conceptions' as follows:

> 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. (p. 204).

In the eyes of Entwistle et al. (2000), conceptions are "built up from a wide variety of sources, including knowledge, images, and experiences" (p. 9). From the standpoint of phenomenography, conceptions carry personal meaning, i.e., variation between conceptions exists and each conception is viewed as relational (Entwistle et al., 2000). It follows that conceptions of teaching involve the different ways in which teachers view, experience, interpret, understand, perceive, and interact with their teaching environment (Marton, 1981). Namely, conceptions of teaching refer to teachers' overall view about the process of teaching (Kember, 1997). Furthermore, conceptions of teaching are regarded as different categories of teachers' thoughts behind their descriptions of how they experience the teaching process (Pratt, 1992a).

6.2.1 Conceptions of teaching at tertiary level

After reviewing 13 studies about university teachers' conceptions of teaching, Kember (1997) proposed a model that involved five dimensions of conceptions of teaching: the essence of learning and teaching, the roles of student and teacher, the aims and expected outcome of teaching, the content of teaching, and the preferred styles and approaches to teaching.

Kember further proposed a two-level synthesis of category descriptions under two broad orientations characterised as 'teacher-centred/content-oriented' and 'student-centred/ learning-oriented'. Kember also presented a transitionary category labelled 'student-teacher interaction' to link the two orientations. Beneath the two orientations were five conceptions: 'imparting information', 'transmitting structured knowledge', 'student-teacher interaction', 'facilitating understanding', and 'conceptual change/intellectual development'. These five teaching conceptions were arranged on a continuum from the most teacher-centred extreme to the most student-centred extreme, as illustrated in Figure 6.1.

Figure 6.1. Categorisation Model of Conceptions of Teaching

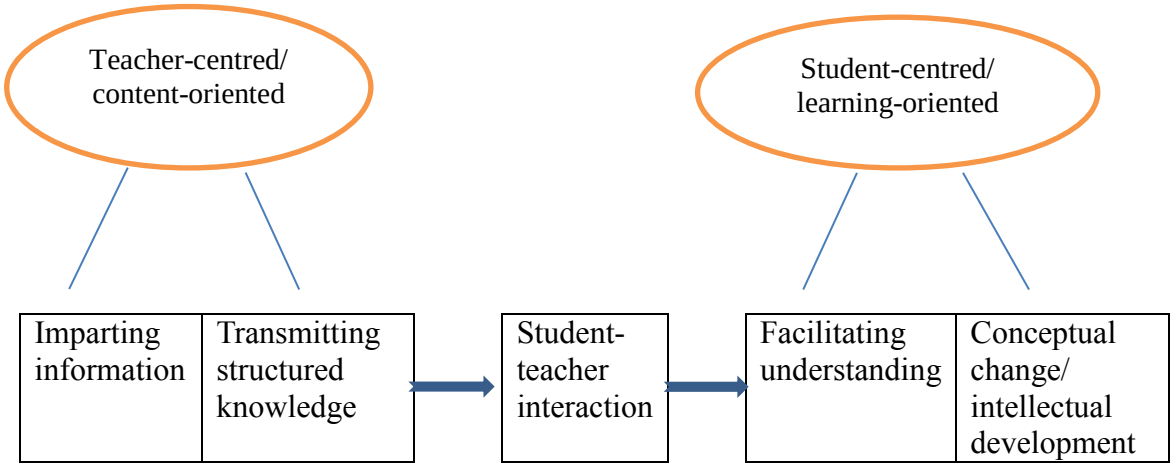


Figure 6.1. A multiple-level of conceptions of teaching. Adapted from "A Reconceptualisation of the Research into University Academics' Conceptions of Teaching," by D. Kember, 1997, *Learning and Instruction, 7,* p. 264. Copyright by the Elsevier Science Ltd.

Consistent with Kember's (1997) study, Samuelowicz and Bain (2001) conducted an experimental study on academics' conceptions of teaching. They reported two orientations of conceptions of teaching and learning: 1) teacher-centred orientation and 2) learning-centred orientation. They also reported a 'transitional' category, labelled 'providing and facilitating understanding' and 'helping students develop expertise'. This transitional category provided empirical support for Kember's (1997) transitionary category, but it focused on the purpose and nature of the interaction rather than the interaction *per se* (Kember, 1997).

Table 6.1[2] shows categories of conceptions of teaching and learning from 14 studies at tertiary level. The studies in Table 6.1 seem to bear out the existence of two broad orientations of conceptions of teaching and learning, ranging from focusing on a teacher/content-centred orientation to a student/learning-centred orientation, and a transitional category linking the two orientations.

[2] Table 6.1 was adapted from Tables in Samuelowicz and Bain's (2001, p. 302 – 303) and Kember's (1997, p. 260) studies.

Table 6.1

Categories of Conceptions of Teaching

Study	Knowledge conveying categories (teacher-centred orientations)		Intermediate categories	Facilitation of learning categories (student-centred orientations)		
Larsson (1983) (phenomenographic)	Transmitting information			Facilitating learning		
Fox (1983)*	Transfer	Shaping	Building	Travelling	Growing	
Dall'Alba (1991) (phenomenographic)	Presenting information Transmitting information	Connecting theory to practice	Developing concepts Developing capacity to be expert	Exploring ways of understanding	Bringing about conceptual change	
Martin and Balla (1991) (phenomenographic)	Presenting information		Encouraging active learning		Relating teaching to learning	
Samuelowicz and Bain (1992)	Imparting information	Transmitting knowledge	Facilitating understanding		Changing students' conceptions	Supporting students' learning
Pratt (1992b) (phenomenographic)	Delivering content		Modelling ways of being	Cultivating the intellect	Facilitating personal agency	
Martin and Ramsden (1992) (modified phenomenographic)	Presenting content of process	Organising content or process	Organising learning environment		Facilitating understanding through engagement with content and process	
Gow and Kember (1993) Kember and Gow (1994)	Knowledge transmission			Learning facilitation		
Prosser et al. (1994) (phenomenographic)	Transmitting concepts Transmitting teacher's knowledge	Helping students acquire concepts Helping students acquire teachers' knowledge	Helping students develop concepts		Helping students change concepts	
Trigwell et al. (1994) Trigwell and Process (1996b) (phenomenographic)	Information transmission / Teacher-focused	Concept acquisition/ Teacher-focused	Concept acquisition/ Student-teacher interaction	Conceptual development/ Student-focused	Conceptual change/ Students-focused	
Kember and Kwan (in press)	Passing information	Making it easier for students to understand		Meeting students' learning needs	Facilitating students to become independent learners	
Kember (1997) (synthesis of literature)	Imparting information	Transmitting information	Student-teacher interaction	Facilitating understanding	Conceptual change/ Intellectual development	
Samuelowicz and Bain (2001)	Imparting information	Transmitting structured knowledge	Providing and facilitating understanding Helping students develop expertise	Preventing misunderstanding	Negotiating understanding	Encouraging knowledge creation

*Although Fox did not order his 'personal theories of teaching' along one dimension,

he did favour ‘developed’ over ‘simple’ theories and implied that student-initiated learning is more appropriate than teacher-initiated learning.

6.2.2 Conceptions of teaching at school level

Compared with categories of conceptions of teaching and learning at tertiary level, categories of conceptions of teaching and learning at school level are limited. In a study with 16 secondary school teachers across subjects in Australia, Boulton-Lewis et al. (2001) identified four categories of school teachers’ conceptions of teaching: 1) transmission of content/skills, 2) development of skills/understanding, 3) facilitation of understanding, and 4) transformation of students. They further identified four categories of conceptions of learning: 1) acquisition and reproduction of content/skills, 2) development and application of skills/understanding, 3) development of understanding, and 4) transformation.

Gao and Watkins (2001, 2002), examining senior high school physics teachers’ conceptions of teaching in China, proposed two higher-level orientations to teaching characterised by: 1) “moulding orientation” – (to mould students quantitatively based on external demands such as course syllabuses, textbooks, and examinations), and 2) “cultivating orientation” – (to develop students’ ability and cultivate their attitude and conduct). Under these two orientations were five categories of conceptions of teaching: ‘knowledge delivery’, ‘exam preparation’, ‘ability development’, ‘attitude promotion’ and ‘conduct guidance’.

6.2.3 Comparison of categories of conceptions of teaching held between university teachers and school teachers

A comparison of categories of conceptions of teaching between university teachers and school teachers is presented in Table 6.2.

Table 6.2

Comparison between Categories of Conceptions of Teaching between University Teachers and School Teachers

In the Western context	Teacher-centred (content-oriented)			Student-centred (learning-oriented)		
Kember (1997) (synthesis of literature) *(at the tertiary level)*	Imparting information	Transmitting information	Student-teacher interaction	Facilitating understanding	**Conceptual change (Intellectual development)**	
Boulton-Lewis et al. (2001) *(at the school level)*	Transmission of content and skills	**Developments of skills and understanding**		Facilitation of understanding	**Transformation of students**	
In the Chinese context	Moulding orientations			Cultivating orientations		
Gao and Watkins (2002) *(at the school level)*	Knowledge delivery	**Exam preparation**		Ability development	**Attitude promotion**	**Conduct guidance**

Table 6.2 suggests that there are similar categories of conceptions of teaching held by university teachers and school teachers. They both move from a focus on knowledge transmission, i.e., teacher-centred/content-oriented, to facilitation of learning, i.e., student-centred/learning-oriented, along the continuum. With respect to teacher-centred orientation, teaching is seen as what the teacher does with the content. With regard to student-centred orientation, teaching is viewed as whether the student understands the content.

However, there is a subtle difference in the most student-centred extreme category, between university teachers and school teachers. In this category, most university teachers hold conception of 'conceptual change', whereas most school teachers hold conception of 'transformation of students'. That is, most university teachers see teaching as helping students change their conceptions or world views, while most school teachers view teaching as developing the student as a whole person.

There are also fine differences in the most student-centred extreme category, between school teachers in the Western and Chinese context. In Australia, most school teachers, who hold the conception of 'transformation of students', focus on developing students cognitively, behaviourally, and affectively by providing

opportunities, experiences, and activities. In contrast, in China, most school teachers, who hold the conception of 'transformation of students' attitude and conduct', centre on the development of students' good attitude and conduct by teachers' exemplary effect. Another difference is that teachers in Australia with a teacher-centred orientation tend to stress the development of students' understanding, whereas those in China ware inclined to emphasise helping students prepare for examinations.

6.2.4 The relationship between categories of conceptions of teaching

Researchers have divergent views about the relationship between categories of conceptions of teaching (Kember, 1997). Some researchers argue for a "hierarchical ordering" (e.g.,Biggs, 1989; Martin & Balla, 1991; Dall'Alba, 1991). For instance, Dall'Alba (1991, p. 296) states that categories of conceptions are ordered from less to more complete understandings of teaching: at the lowest level, teaching is seen in terms of the teacher alone; at the higher level, students' understanding of the content beceme prominent. Finally, the most complete conceptions centre on the relationship between teacher, student, and content.

Nevertheless, some researchers do not use the term 'hierarchical ordering' in their findings. For example, Fox (1983) orders his four categories in a 2 × 2 matrix delineated by simple/developed theories and content/student-centered orientation, whereas Dunkin (1990) arranges them in order of frequency of occurrence. Samuelowicz and Bain (1992) argue that these conceptions are not hierarchically organised because the more sophisticated conceptions do not include the less sophisticated ones, and they further state that there is a " broad agreement that these conceptions can be arranged on a continuum" (p. 93). Martin and Ramsden (1992) indicate that lecturers' conceptual development is based on changes in their conceptualisation of teaching, the nature of their subject matter and the way students learn. Pratt (1992a) further argues that the five conceptions he identified are, although qualitatively different, not mutually exclusive. The aforementioned studies suggest "the alternative conceptions of teaching are better regarded as an ordered set of qualitatively different conceptions rather than as a hierarchical ordering" (Kember, 1997, p. 263).

Still other researchers talk of two contrasting subsets: teacher-centred and student-centred (e.g., Gow & Kember, 1993; Prosser et al., 1994; Kember, 1997). Gow and Kember (1993) identify two main orientations of teaching: knowledge

transmission and learning facilitation. Prosser et al. (1994) talk of two strongly contrasting subsets: a transmission and acquisition category and a conceptual development and change category. Kember (1997) proposes two orientations to complete his model: teacher-centred/content-oriented and student-centred/learning-oriented. Samuelowicz and Bain (2001) also report two orientations for conceptions of teaching and learning: teaching-centred orientation (transmissive) and learning-centred orientation (facilitative).

Though diverse views are expressed about the relationship between categories of teaching conceptions, Pratt (1992a) argues that it would be wrong to draw the conclusion that "some conceptions are better than others" because each conception has "philosophical and epistemological roots which are consonant with particular people, purposes, and contexts" (p. 218).

6.3 Studies of conceptions of teaching and learning in terms of epistemological beliefs

Another strand of research on conceptions of teaching and learning is concerned with teachers' epistemological beliefs. Conceptions of teaching in this line are associated with traditional/transmissive conceptions of teaching and learning as well as progressive/constructivist conceptions of teaching and learning (Clements & Battista, 1990; Clifford, 1992). This dichotomy runs parallel 1) to conventional-direct-recitation teaching and progressive-discovery-constructivist teaching (Gage, 2009), and 2) to teacher-centred orientation and student-centred orientation (Kember, 1997). From this, conceptions about teaching and learning refer to the beliefs held by teachers about their preferred ways of teaching and learning, which include the meaning of teaching/learning and the role of the teacher/student (Chan & Elliott, 2004).

With regard to teachers' epistemological beliefs, Schommer (1990, 1994a, 1994b) proposes that personal epistemology is one's beliefs concerning the nature of knowledge and gaining knowledge. This belief system is composed of five dimensions: the source, certainty, and organisation of knowledge, as well as the control and speed of learning. According to Schommer (1994), epistemological beliefs are arranged along a continuum from naïve to sophisticated beliefs. A teacher with a naïve epistemology generally believes that knowledge is simple, clear, certain and

unchanging, and resides in authorities. Further, concepts are learned quickly and learning ability is innate and fixed. Conversely, a teacher with a sophisticated epistemology believes that knowledge is complex, uncertain, and tentative. Additionally, they believe that knowledge can be learned gradually through reasoning processes and can be constructed by the learner (Howard et al., 2000; Schommer, 1994).

It is likely that Schommer's naïve epistemologies are parallel to traditional/transmissive conceptions, while Schommer's rather more sophisticated epistemologies reflect constructivist conceptions (Chan & Elliott, 2004). Pajares (1992) suggests that educational belief or value orientation seems to play a crucial role in teachers' judgments about what knowledge is relevant to a particular situation. From this perspective, there may be particular relationships between teachers' epistemological beliefs and their conceptions about teaching and learning (Chan & Elliott, 2004).

A number of studies have investigated the relationship between teachers' epistemological beliefs and their conceptions about teaching and learning. For instance, a study with Hong Kong student teachers by Chan and Elliott (2004), found that there were positive significant relationships between traditional conceptions of teaching and learning and three epistemological belief dimensions: innate ability, authority of knowledge, and certainty of knowledge. Further, there were negative relationships between constructivist conceptions and one epistemological dimension: effort. The conclusion supports the idea that teachers' conceptions about teaching are belief driven. In addition, these Hong Kong student teachers tended to believe that knowledge was acquired through one's effort rather than being handed down by authority figures. This conception may be influenced by Confucian culture in which effort, endurance, and hard work are emphasised (Yang, 1986).

Consistent with the preceding study, Aypay (2010) found that there was a medium positive relationship between traditional conception and two epistemological belief dimensions: innate ability and certainty of knowledge. Further, there was a low positive relationship between constructivist conception and one epistemological belief dimension: effort. Again, the results support the idea that teachers' conceptions about teaching are belief driven. Additionally, Turkish student teachers strongly preferred a constructivist conception of teaching and learning to a traditional conception.

However, Cheng et al. (2009) argue that the assertion that conceptions of

teaching are belief-driven needs to be understood with caution. They found mixed results concerning the relationship between Hong Kong student teachers' epistemological beliefs and their conceptions of teaching. Some student teachers, who had sophisticated epistemological beliefs, were apt to believe a constructivist conception of teaching. Some who had sophisticated or mixed (both naïve and sophisticated) epistemological beliefs tended to believe in constructivist or mixed (both constructive and traditional) conceptions of teaching. Still other student teachers' epistemological beliefs were inconsistent with their conceptions of teaching. It is noteworthy that, consistent with Chan and Elliott's (2004) study, most of these pre-service Hong Kong teachers believed that learning effort was more important than innate ability, and they had much stronger tendency towards the constructivist conception of teaching.

Contrary to the findings of the preceding studies (that pre-service teachers preferred a constructivist conception in teaching), a number of other studies (e.g., Donnelly, 1999; Tsai, 2002; Koballa, et al., 2000) found that in-service and pre-service science teachers tended to have traditionally-oriented conceptions about teaching. Tsai (2002) revealed that most Taiwanese secondary school science teachers had traditionally-oriented conceptions about teaching science, learning science and the nature of science. These teachers viewed teaching science as transferring knowledge from the teacher to the student, and learning science as acquiring or reproducing knowledge from credible sources. Koballa et al. (2000) showed that the majority of German prospective chemistry teachers conceptualised learning as reproductive rather constructive knowledge, and teaching as facilitating reproductive learning. Similarly, Donnelly (1999) found that secondary school British science teachers emphasised established knowledge and perceive uncertainty as threatening.

In brief, the studies mentioned above show that student teachers tend to have constructive conceptions whereas experienced teachers tend to have traditional conceptions. It is noteworthy that teachers of science are inclined to have traditional conceptions.

6.4 The relationship between conceptions of teaching and teaching strategies

In respect to the interrelatedness between teachers' conceptions of teaching and their teaching strategies, studies show mixed results (Donche & Van Petegem, 2011).

A number of studies in the higher education context have revealed that there are consistent relationships between conceptions of teaching and teaching strategies. For example, Gow and Kember (1993) indicated that the conceptions of lecturers from Hong Kong about teaching had a strong influence on the methods they adopted. Trigwell and Prosser (1996a) reported that there was a strong relationship between conceptions of teaching and approaches to teaching. Trigwell and Prosser (1996b) found a relationship between lecturers' intentions and their teaching strategies. Similar results were obtained with secondary teachers, whose teaching strategies were consistent with their conceptions (Boulton-Lewis et al., 2001).

Likewise, Kember and Kwan (2000) showed that lecturers' approaches to teaching were positively related to their conceptions of good teaching. Lecturers who conceived of good teaching as the transmission of knowledge tended to use content-centred approaches to teaching, whereas those who conceived of good teaching as facilitative were more likely to adopt learning-centred approaches. For instance, teachers who tended to favour transmissive teaching determined what was important for the students to learn and provide them with a lot of materials. Additionally, they emphasised motivators extrinsic to their teaching, including syllabuses, examination marks, and qualification. In contrast, those who were inclined to favour facilitative teaching passed on material and content but placed greater emphasis on encouraging students to discover and construct knowledge. Further, they recognised that motivating students was an intrinsic part of their teaching role.

Contrary to the aforementioned research, other studies have demonstrated inconsistent relationships between teachers' conceptions of teaching and the teaching strategies they adopt. For instance, Fang (1996) reported that there were inconsistencies between teachers' conceptions and practices. Murray and Macdonald (1997) also found disjunctions between lecturers' conceptions of teaching and their educational practice. Donche and Van Petegem (2011) reported that the consistency between teacher educators' conceptions and their teaching strategies could only be partially supported.

Briefly, the inconsistencies between teachers' conceptions and strategies may be due to personal and contextual factors (Donche & Van Petegem, 2011).

6.5 Subject differences in conceptions of teaching and learning

Several studies have investigated subject differences in conceptions of teaching and learning at school level. For example, Boulton-Lewis et al. (2001) reported that Australian secondary teachers' conceptions of teaching and learning were associated with the subject matter they taught. Teachers of English literature, personal and spiritual development, and art in soft areas were likely to view teaching and learning as a transformation of learners cognitively, behaviourally, and affectively. Second language teachers believed that teaching primarily involved transmission of content or skills, and that learning depended on the acquisition and reproduction of these things. In contrast, mathematics and science teachers viewed teaching as the development of skills and the facilitation of understanding, and learning via the acquisition and reproduction of content and the development of understanding.

Donnelly (1999) found that secondary school history teachers in England and Wales placed students' interpretations and intellectual judgments at the centre of their work, while science teachers placed a stronger emphasis on established knowledge and perceived uncertainty to be threatening. In a similar vein, Aguirre et al. (1990) revealed that almost 50% of pre-service secondary science teachers in Canada held the view that teaching was a matter of knowledge transfer from the teacher's mind and textbooks to the 'empty' minds of children. They also assumed that teachers were primarily sources of knowledge. Consistent with this, Tsai (2002) showed that most secondary school science teachers in Taiwan expressed traditional views about teaching, learning and science. That is, they believed that science was best taught by transferring knowledge from the teacher to the student,

On the other hand, Patrick (1992) found a parallel set of conceptions among secondary teachers of history and physics. History and science teachers' conceptions of teaching ranged from the delivery of content to the development of understanding, and their conceptions of learning ranged from the accumulation of information to the construction of knowledge.

To sum up, the above-mentioned studies indicate that, although teachers hold different conceptions of teaching and learning across subjects, science teachers have a tendency to view teaching as transferring knowledge.

6.6 The role of the teacher

According to Ben-Peretz et al. (2003) and Zuljan (2007), a teacher's perception of their professional role is closely linked to their self-image and has strong impact on their understanding, view, and interpretation of their teaching context, pedagogical decisions and actions, and their student's learning and achievement. Because this study aims to investigate the conceptions of teaching among Taiwanese teacher, and the teacher's role is one of dimensions used to delimit conceptions of teaching, it is of significance to realise the ideal role of the teacher, as proposed by researchers, and the assumed role of the teacher, as spoken of by pre-service and in-service teachers.

6.6.1 The ideal role of the teacher

Some research about the role of the teacher has explored the ideal role of the teacher (e.g., Harden & Crosby, 2000; Shim, 2008; Yayli, 2009). For example, Harden and Crosby (2000) identify twelve roles of teachers in medical education in the UK and grouped them into six areas: 1) the information provider – (the teacher is seen as an expert who is knowledgeable in his or her field and who conveys that knowledge to students), 2) the role model – (the teacher should model or exemplify what should be learned), 3) the facilitator – (a mentor and learning facilitator), 4) the student assessor and curriculum evaluator, 5) the curriculum and course planner, and 6) the resource material creator and study guide producer.

Similarly, Shim (2008) proposes the ideal role of the teacher through the examination of four philosophers: Plato, Confucius, Buber, and Freire. Plato views teaching as guidance into objective knowledge through the reasoned understanding of causes. In this view, the teacher's role is as an intellectual guide who leads learners to change their direction from ignorance or distortion to reality or truth. Confucius regards teaching as leading self-cultivation, and the teacher's role as a role model who exemplifies good character to their students. Buber views teaching as discovery or recovery of one's authentic being through sharing. In this view, the teacher's role involves building relationships with their students. Freire refers to teaching as a critical discovery of the oppressed and dehumanised situation, and to the teacher's role as a co-investigator to encourage students to view the world through their own critical lens by means of dialogical co-investigation.

Yayli (2009) presents ideal new roles for literary teachers in Turkish literacy

classrooms. These six new roles are 1) teacher as co-inquirer – (the teacher and the student are co-inquirers or border-crossers who emphasise the fact that teachers are learners who continuously develop themselves in the process of teaching, and students are expected to develop a thinking practice through interaction with their teachers), 2) teacher as mediator –(the teacher is the mediator of knowledge), 3) teacher as intellectual – (the teacher is an intellectual and master of critical thinking), 4) teacher as liberator – (the teacher is the liberating model that empowers students to question the social reality around them), 5) teacher as child observer – (the teacher observes students and gives them support), and 6) teacher as researcher – (the teacher needs to create an ongoing practise-research-practise chain in the classroom).

Oxford et al. (1998) and Guerrero and Villamil (2002) consider the role of the teacher from four major philosophical viewpoints of educational thought. They state that the role of teacher is an agent for 1) social order – (a social engineer who shapes students for the needs of society), 2) cultural transmission – (a gatekeeper who transmits the cultural heritage of the society to the students), 3) learner-centred growth – (a facilitator of personal growth and emotional development), and 4) social reform – (a social reformer to facilitate the creation of an autonomous individual in a democratic community).

In short, the studies mentioned above show that there is some commonality between researchers as to the ideal roles of the teacher, and this is presented in Table 6.3.

Table 6.3 Commonality of the Ideal Roles of the Teacher

Study / Teacher role	Harden and Crosby (2000)	Shim (2008)	Yayli (2009)	Oxford et al. (1998) Guerrero and Villamil (2002)
Knowledge provider	Information provider	Plato	Mediator	Cultural transmission
Role model	Role model	Confucius		
Learning facilitator	Facilitator	Plato	Intellectual	Facilitator
Researcher	Curriculum/course planner & resource material creator		Researcher	
Co-inquirer		Freire (co-investigator)	Co-inquirer	
Liberator		Buber	Liberator	Social reformer

Table 6.3 illustrates that there are some similarities between the ideal roles of the teacher held by the aforementioned researchers. They generally view the ideal roles of the teacher as a knowledge provider, a role model, a learning facilitator, a researcher, a co-inquirer, and a liberator.

6.6.2 The assumed role of the teacher

A number of studies (e.g., Martinez et al., 2001; Saban et al., 2007) have examined the teacher's role expressed by experienced teachers. For example, in their study with fifty experienced teachers, Martinez et al. (2001) reported that the majority shared traditional metaphors that depicted teaching and learning as transmission of knowledge, a small group of teachers expressed constructivist metaphors, and only a minority conceived of teaching and learning as a social process.

Parpala and Lindblom-Ylanne (2007) found that university teachers in Finland expressed two dimensions of the teacher's role for good teaching. One was that teachers had to inspire students, and that teaching aimed to boost students' motivation to learn more. The other was that the teacher had to be an expert in his/her field, and that teaching was based on current and exact information about the subject matter. Aydın et al. (2010) revealed that mathematics teacher educators regarded the roles of the teacher as a facilitator, a guide, an autonomy supporter, an authoritarian, and an encourager. All of these roles could be argued to conform to constructivist approach with the exception of 'authoritarian'.

Other studies have investigated the role of the teacher spoken of by student teachers. For example, Zuljan (2007), examining first-year students of primary education in Slovenia, reported that the majority perceived the role as mainly a transmitter of knowledge, and the minority conceived of the teacher as an encourager of students' understanding. Two other studies found that there were disciplinary differences in pre-service teachers' conceptions of the teacher's role. Demirbolat (2006) found that most student teachers of mathematics agreed with static institutional roles – (viewing their roles solely as a means of teaching the subject), whereas student teachers of Turkish generally showed positive responses towards democratic roles – (seeing their roles as helping students to have positive developments in their personalities).

Saban et al. (2007) revealed that there was a significantly different relationship

between programme type and prospective Turkish teachers' concept of the teacher. Students of classroom teaching (CT) generated more shape-oriented, growth-oriented and counselling-oriented metaphors than those of English education (EE) and instructional technology (IT), whereas EE students produced more facilitation-oriented metaphorical images than the CT and IT students. Additionally, the IT students provided more transmission-oriented and cooperation-oriented metaphors than the CI and EE students.

To sum up, the assumed role of the teacher, as referred to by experienced teachers and student teachers, illustrates that teachers' conceptions of the teacher's role is in accord with personal value systems, the subjects they teach, teaching contexts, and cultures.

6.7 Conclusion

The aforementioned studies on conceptions of teaching and learning indicate that teachers' conceptions of teaching and learning are beliefs about what teaching and learning ought to be. Further, their conceptions relate to their personal experiences and values, the subjects they teach, teaching contexts, social norms, and culture. Thus, investigating teachers' conceptions of teaching can help us realise what teachers think and how they act. From this, I may get a clearer picture of what the teachers in the present study think about teaching and learning and the roles of teacher and student. Hopefully, I may find that teachers of certain subjects tend to have a certain type of motivation, as proposed by SDT.

Chapter 7
Interview Data Analysis

This chapter is divided into three major sections – one, two and three.

Section one describes categories of conceptions of teaching and consists of four sub-sections: 1) conceptions of teaching, including the teacher's role, teaching, and good teaching; 2) differences in conceptions of teaching across five subjects; 3) conceptions of teaching methods of instruction; and 4) differences in conception of teaching method of instruction across academic subjects.

Section two illustrates categories of conceptions of learning and is composed of four sub-sections: 1) conceptions of good learning, including the student's role and good learning; 2) differences in conceptions of good learning across subjects; 3) conceptions about individual differences in learning; and 4) differences in conceptions of individual differences in learning across disciplines.

Section three provides an overall summary of conceptions of teaching and learning and a comparison of conceptions of teaching and learning between teachers of maths and science in hard areas and teachers of Chinese, English, and social studies in soft areas.

The analysis is concentrated on the responses themselves and geared to identify the most distinctive characteristics embedded in the responses around the issue related to the research questions. In addition, the analysis emphasises finding qualitatively different conceptions and variations of understanding for each concept that would clarify how teachers of different subjects were thinking about the teacher's role, teaching, the student's role, and learning at the time of completing the interview. Finally, it is assumed that an individual can hold multiple conceptions simultaneously and use them selectively, depending on circumstances (Pratt, 1992a).

7.1. Conceptions of teaching

Conceptions of teaching in this study refer to those aspects of teaching which are important to Taiwanese teachers, i.e., what these teachers personally think teaching ought to be.

This section presents analyses and results related to the teacher's role, teaching, good teaching, and teaching methods of instruction. As there are some overlapping categories in conceptions of the teacher's role, teaching, and good teaching, a summary of categories of conceptions of teaching is described as follows.

7.1.1 Teaching

From the analysis of teachers' responses, five qualitatively different ways of understanding the nature of teaching emerged. Teaching was conceived as (1) transmitting knowledge, (2) modelling ways of being, (3) mutual learning, (4) facilitating learning, and (5) developing students' character.

Category 1: Transmitting Knowledge

In this category, teaching was viewed as transmitting knowledge i.e., imparting facts and information to students. For example, two teachers described their teaching as delivering content in the textbook, teaching a syllabus based on the curriculum, and preparing the student for the Joint College Entrance Examination (JCEE).

> Teaching is to teach the content in the textbook... Because students have to take the JCEE, I have to teach a syllabus based on the national curriculum. (T9 – 45-yr-old: maths)

> Teaching is to teach content designed by the national curriculum. The aim of teaching is to let students understand what you teach and use it to take exams. (T6 – 49-yr-old: Chinese)

A physics teacher emphasised the importance of closely following 'the curriculum guidelines' in teaching on account of the preparation of the student for going to college.

> The content of teaching should be based on the curriculum guidelines... Students in Taiwan have to go to college so the content of teaching should meet the "spirit of the curriculum guidelines". Ninety per cent of the syllabuses on the curriculum guidelines must be completed in our teaching. (T23 – 48-yr-old: science)

A teacher of Chinese stressed the significance of the teacher's 'interpretation' of the materials, i.e., the quality of the presentation.

> Teaching is to use my own word and the form of life to interpret articles. If teachers only teach knowledge in the textbook, but teachers do not 'involve' in teaching. I will feel it is empty. I will try my best to introduce an article and let students connect with the article through me. I think the whole concept of teaching is: a text can be connected with students through my interpretation. (T19 – 30-yr-old: Chinese)

Fox (1983) describes these teachers as "conscientious transferrers" who "spend a great deal of time preparing the material and making sure that it is accurate and up-to-date" (p. 152). They take a view that the integrity of the subject-matter must be of great significance, and see their job as "one of processing very tough material into more easily digestible nutrient for rather simple minds", which is similar to "a baby food manufacturing analogy" (Fox, 1983, p. 153).

The teacher within this category viewed the teacher's role as a knowledge transmitter. Here is an example:

> I often talk to my students, just as Han Yu says, "What is a teacher? A teacher is the one who shows you the way of being human, teaches you knowledge and enlightens you when you are confused". The role of a teacher is to teach students knowledge. (T7 – 40-yr-old: maths)

The quote above agrees with the definitions by Han Yu, one of the most widely recognised scholars and educators in the Tang Dynasty. Han Yu summarised three different roles of a teacher in his book Shi Shuo (On Teachers): "What is a teacher? A teacher is the one who shows you the way of being human, teaches you knowledge, and enlightens you when you are confused" (Liu, Z, 1973, p. 754, cited in Gao & Watkins, 2002). Specifically, one of the three roles of being a teacher in the Chinese culture is to teach students knowledge.

In this category, the student was viewed as a passive recipient of a body of content. One quote from this study illustrates this.

> The role of the student is passive. They absorb what I teach. The student does not need to take any responsibility. Their major responsibility is to learn and understand what I teach. (T1 – 45-yr-old female: science)

Here it is clear that the focus of teaching is knowledge transmission. This conception is in line with Fox's (1983) transfer theory, which regards knowledge as a commodity to be transferred from one vessel to another.

Category 2: Modelling ways of being (a role model)

Within this conception, the teacher was viewed as a role model of correct "moral character" toward one's work and the society, i.e., to exemplify the behaviours, values, and knowledge to be learned. Two quotes from the interviews illustrate this.

> When teaching related to affection, leadership, and passion, teachers have to set examples… A teacher should set examples for students to follow. How teachers deal with problems, treat

> students, and teaching attitude will have a great influence on students. Students will acquire their teachers' attitude toward people and things. (T24 – 36-yr-old: science)

> A teacher should lead students by example…A teacher should be a good model. Senior high school students learn things by example. Just as parents are economical, their children dare not waste money. (T15 – 34-yr-old: social studies)

Teaching was expressed as a duty and obligation and it was a teacher's duty to set a good example for students to follow.

> I am concerned about a person's duty. A high school teacher is a person who teaches knowledge. He must do his duty of teaching knowledge. If he wants to set a good example for his students, he must teach students knowledge well. If we teachers prepare for lessons seriously, students will see a model. I stress being a good example. (T8 – 51-yr-old: Chinese)

"Personal example" was articulated as an important attribute of a good high school teacher.

> Attributes of a good high school teacher are to teach by 身教 (personal example) as well as 言教 (verbal instruction) ... The power of "personal example" is stronger than that of "verbal instruction"... If teachers teach students to have love, then they have to take care of low-achievers first… Teachers are very successful if they meet the standard of "personal example" and "verbal instruction". (T23 – 48-yr-old: science)

In this category, knowledge is to be passed on through role modelling (Pratt, 1992a).This may stem from Confucian philosophy, which emphasises the exemplary effects of teachers. That is, for Confucius, the role of teachers is not so much to explain or discuss what is good or right as to show it directly in their lives (Shim, 2008).

Category 3: Mutual learning (To teach and to learn)

Teaching in this category was seen not as one-way knowledge transmission, but as two-way teaching/learning, i.e., mutual learning. Three quotes illustrate this.

> Teaching is relational. In the process of teaching, I am learning. If students do not understand what I teach, I have to reflect on my teaching methods. In doing so, I can learn. Therefore, teaching should not be fixed, but needs to change… (T10 – 46-yr-old: social studies)

> In the process of teaching, I help others learn and I also learn from them. Teaching benefits teachers as well as students. In the process of knowledge transmission, there are new discoveries. When teachers prepare lessons, they learn something new. Students are also subjects of change and so are teachers. So 教學相長 (teaching benefits teachers and students alike). (T30 – 35-yr-old: social studies)

A teacher used the metaphor of 'running' to express his idea of mutual learning.

> I feel teaching is like running. I hope students can run after me. The process of teaching is like the process of running. Teachers cannot stop and wait for students. They have to amend their

> steps to be with students. I regard teaching as teachers' running from one stop to another stop with students. It means that not only students are learning but also I am learning. (T20 – 39-yr-old: Chinese)

The teachers in this category described their teaching as teaching and learning. This view may be dated back to Confucius' concept of learning, who tried to cultivate himself by continuously studying and teaching. Hall and Ames (1987, p. 44) point out that the original character of 學 (to learn) is 斆 (to teach). During the pre-Ch'in period, scholars sought to become learned men through teaching as well as learning. That is, "to learn" in the Chinese character indicates that personal growth is through the mutual efforts of teaching and studying (Shim, 2008). This view of teaching as involving learning too may also be traced back to the Book of Rites, which states "jiao xue xiang zhang" (teaching benefits teachers and students alike).

The aforementioned reasons may account for the teachers' view that teachers not only help students grow but also improve themselves through reflection on their teaching.

Category 4: Facilitating learning

In this category, teaching was viewed as facilitating the development of understanding of knowledge. For example, one teacher asserted that the outcome of the teaching process was that students understood the concepts of the subject and demonstrated this by applying the knowledge to their lives.

> Teaching is to teach basic knowledge in the textbook and then students apply it to their lives…, to identify with the social norm and systems, and thereby to have independent thinking... (T15 – 34-yr-old: social studies)

Another teacher talked about her awareness of the disadvantages of the method of knowledge transmission and knew that she could influence students' learning outcomes. Thus, her teaching became a process of helping students understand concepts and develop critical thinking.

> The method of transmitting knowledge is not good enough. We let students learn things on the surface and students do not have the ability to discuss matters. I teach many students and know their confusion about some concepts. I think teaching should let students have more chances to think and debate… I will give students questions to discuss and help students think concepts clearly … I will design activities for students to discover and challenge their original ideas or concepts. (T21 – 40-yr-old: science)

These teachers saw their roles as a guiding process to facilitate students to understand and acquire knowledge. For example, a teacher talked about her role as

designing an optimal 'learning environment' to arouse students' interest to learn English.

> I will …design a learning environment just like a house. I will arrange a closet, a sofa, and drawers in good order. Students can get any information from this learning environment. My role is to design a learning environment and students can take information at will. This is mainly because I want to arouse students' interest and hope they can acquire the methods of learning English. (T2 – 43-yr-old: English)

Another two teachers viewed their roles as intriguers who helped students develop critical thinking and understanding of the subject.

> I will give questions for students to think about the story behind articles or the intention the author tries to convey … I will let them be engaged in learning by asking questions. (T20 – 30-yr-old: Chinese)

> Senior high school students are more mature … capable of discussion and developing their ideas. A teacher is an intriguer by asking questions and leading them to think... (T5 – 48-yr-old: English)

The teachers within this category viewed teaching as facilitating the intellectual development and personal autonomy of their students. Knowledge was not taken-for-granted, but open to question and interrogation. These conceptions the teachers held may be traced back to Plato's view of the role of the teacher as an intellectual guide who leads or guides students to search for truth through knowledge (Shim, 2008).

Category 5: Developing students' character

In this category, teaching maintained a concern for delivery of content but added a dimension – the development of students' character. For instance, below are three examples of describing teaching as a process of helping students change their attitude toward learning and their lives and further shape their character.

> The aim of teaching includes not only knowledge but also an attitude... Grades are not the most important aim of my teaching. As long as students make efforts though their grades are poor, I will say to them, "Your attitude is 100 points." Your attitude will influence your future and you should use this attitude to learn physics. (T13 – 46-yr-old: science)

> Teaching is to inspire a person's knowledge and character. I believe that a certain kind of a teacher will produce the same kind of students... Students can become a kind of person whom their teachers want them to be. (T28 – 30-yr-old: Chinese)

> I do not think it is good teaching that students can enter the top three universities. What I care is that besides entering a good university, students' development of their character must be on the right track. …in addition to teaching knowledge, the aim of teaching should contain teaching students how to conduct themselves and to be good people. (T29 – 46-yr-old: science)

A maths teacher explained his teaching as a way of socialising students into social norms and cultural values:

> A maths teacher is to teach maths logics, i.e. the causality. I often tell my students that …however you are learning or conducting yourself, there is a relationship between cause and effect... Hence, during the process of teaching maths, I will teach them principles of conducting oneself and handling tasks. When teaching similar concepts, I will say different methods lead to different results. The same concept in maths can be applied to conducting oneself and handling tasks. I often tell students that if you learn maths so much but you do not know the principles of conducting oneself and handling tasks, I will teach you how to conduct yourself and handle tasks rather than teach you maths. (T22 – 47-yr-old: maths)

The teacher's role within this category was viewed as moulding or developing the 'character' of learners. Four quotes illustrate this:

> Because I know students will have no one to guide them about the moral education after they go to college. So I consider I am the last "goalkeeper" of moral education. (T2 – 43-yr-old: English)

> Teachers should help students develop moral conduct… construct the system of values, moral affection... (T30 – 35-yr-old: social studies)

> I want high school students to know a sense of honour and responsibility after they graduate from the senior high school. Sweeping the floor has many benefits...I think we can see a person from the way he sweeps the floor. So the responsibility of a high school teacher is to instil a sense of responsibility and honour into students. (T14 – 49-yr-old: maths)

> Teachers are endowed with the responsibility of education. That is, teachers have to educate students' character, personality, a sense of responsibility, and respect. (T29 – 46-yr-old: science)

The above-mentioned statements are consistent with Meyer's (1988) study, in which Chinese teachers are seen as having the parent-like responsibility of guiding students' everyday behaviour.

This conception contains two elements of teaching: first, there is a responsibility to deliver useful content; second, there must be an aspect of 'moral education' in the content. These two aspects are complementary to each other. The teachers in this category tended to put greater emphasis on the development of the students as people with good character than on cultivating the intellect. In a sense, teaching is explained as a way of socialising students into cultural values (Pratt, 1992a). These cultural values may be rooted in Confucius' teaching, which centres on the student who becomes a man of character rather than on knowledge (Shim, 2008).

7.1.2 Differences in conceptions of teaching between teachers across subjects

This section illustrates differences in conceptions of teaching between Chinese, English, social studies, maths, and science teachers in the following sequence: (1) the

role of the teacher, (2) teaching, and (3) good teaching. Given there are many small differences, the following sections present the main findings.

7.1.2.1 The role of the teacher

The interview data of Taiwanese senior high school teachers' conceptions of the role of the teacher (see Appendix 7.1A for the categories of the role of the teacher and Appendix 7.1B for details of the frequency of each category) show that 'developing students' character' was the most widely identified conception of the role of the teacher, indicating that these teachers seemed to place high value on the development of students' character. The results are consistent with the findings of three studies, including Pratt's (1992b) study, in which teaching was conceived as the development of moral character of learners and Gao and Watkins' (2001, 2002) studies, in which some teachers perceived learning as a process of conduct cultivation and teaching as facilitating changes in students' conduct.

In general, more maths and science teachers in hard areas in this study viewed the teacher's role as transmitting knowledge than Chinese, English, and social studies teachers in soft areas. In contrast, more teachers of Chinese, English, and social studies viewed the teacher's role as facilitating students to learn than those of maths and science. It is noteworthy that none of the maths teachers spoke of the teacher as a role model.

7.1.2.2 Teaching

With regard to conceptions of teaching (see Appendix 7.2A for the categories of teaching and Appendix 7.2B for details of the frequency of each category), 'transmitting knowledge' was the most widely identified conception of teaching, followed by 'mutual learning'. Consistent with the findings of conceptions of the teacher's role, more maths and science teachers in hard disciplines were apt to view teaching as 'transmitting knowledge'. In contrast, teachers in soft disciplines, especially English teachers, tended to view teaching as 'mutual learning' and 'facilitating learning'.

Both findings of conceptions of the teacher's role and teaching illustrate that more maths and science teachers were apt to view teaching as 'transmitting knowledge' and saw the teacher's role as 'knowledge transmitter'. These results are consistent with a study by Aguirre et al. (1990), which considered science teachers as

presenters of the factual content of scientific knowledge and of transferring knowledge to students. This could be explained by Donnelly's (1999) study, in which many science teachers held a belief that scientists placed a stronger emphasis on established knowledge and perceived uncertainty as threatening .

By contrast, more Chinese, English, and social studies teachers in this study were inclined to view teaching as ‘mutual learning’ and ‘facilitating learning’ and saw the teacher’s role as ‘facilitating learning’. These findings are similar to Hativa’s (1997) study, which found that soft areas in the universities placed considerable emphasis on creativity of thinking and oral expression, and to Lattuca and Stark's (1994) study, which revealed that soft fields strongly stressed students’ growth and development, discussion and communicative skills.

7.1.2.3 Good teaching

With respect to conceptions of good teaching, three categories of good teaching different from conceptions of teaching mentioned in earlier section emerged (see Appendix 7.3 for detailed categories of conceptions of good teaching). These three categories are listed as follows: (1) good academic performance, (2) joyful teacher-student interaction, and (3) facilitating students to become active and independent learners.

The interview data (see Appendix 7.3B for details of the frequency of each category) reveals that compared with teachers of the other four subjects, more science teachers viewed ‘facilitating students to become active and independent learners’ as good teaching. The results imply that science teachers were inclined to have a higher level of intrinsic motivation toward Teaching. For example, two science teachers described good teaching as ‘motivating students’ by grabbing students’ interest and willingness to learn the subject.

> Teachers should spark students’ interest and motivate them to learn. Then they will be willing to learn. (T11 – 31-yr-old: science)

> Students are highly motivated to learn this subject. Also they feel interested in this subject. (T13 – 45-yr-old: science)

In contrast, more English teachers referred to good teaching as ‘good academic performance’ than teachers of the other four subjects. This indicates that

English teachers had an inclination to have external regulation toward Teaching. Here are two examples:

> The indicators of good teaching are outcomes of learning – student's … good grades. (T3 – 40-yr-old: English)

> Students' good grades are a direct reward. Teachers give students English knowledge and let them get good grades in the test. (T5 – 48-yr-old: English)

It is interesting to note that none of the maths and science teachers spoke of 'developing students' character' as good teaching but more Chinese teachers referred to 'developing students' character' as good teaching.

7.1.3 Teaching methods of instruction

Teaching methods of instruction in the present study refer to the most commonly used teaching methods of instruction expressed by the respondents. Three conceptions of teaching methods of instruction emerged. Teaching methods of instruction were viewed as (1) lecturing, (2) inquiry/questioning or activities, and (3) discussion.

Category 1: Lecturing

In this category teachers adopted lecturing as a way of transmitting to the student information about the discipline. The focus was on transmitting facts and skills. For example, two teachers believed that lecturing was the most effective way to teach.

> Giving lectures is the fastest. When I lecture, I can control the speed and explain concepts very clearly. (T7 – 40-yr-old: maths)

> Giving lectures is the most effective way, and this way I can save some time for students to take tests. (T27 – 30-yr-old: English)

Three teachers said that giving lectures was the only strategy they could use due to the characteristics of the subjects (maths, history).

> The most common strategy I employ in teaching is to give lectures. ..If I do not use lectures, what other strategy can I use? ... Maths is not like citizenship education - which can be discussed or debated... Teaching maths is to teach definitions from which it develops a set of formulas. Teachers have to lecture these definitions and I do not ask students to discuss. (T16 – 51-yr-old: maths)

> Give lectures is a traditional method … very common in maths teaching. Teaching maths is to introduce concepts to students first so teachers need to lecture... Traditionally, maths teachers teach in this way. I seldom have group discussion because students do not have such ability to discuss. (T14 – 49-yr-old: maths)

> The most common strategy I employ in teaching is lecturing. It is because of the characteristics of the subject, history. History is dominated with lectures. I cannot make experiments in history class. Nor can I play games. Doing such activities seems to waste much time. (T12 – 51-yr-old: social studies)

Another three teachers explained that they gave lectures on account of too many syllabuses to be completed within a limited time and the assessment system.

> Giving lectures is because there are too many syllabuses; it is quick to transmit knowledge within a limited time by means of lectures... What's more, the JCEE only assess students by standardized tests, not assess students' creativity. Giving lectures can help student get good grades... (T11 – 31-yr-old: science)

> Giving lectures is because I cannot complete lesson plan. If a teacher cannot complete lesson plan, they will not be regarded as a good teacher… I observe that teachers are very nervous about the completion of the lesson plan due to time pressure and too many syllabuses. (T30 – 35-yr-old: social studies)

> I talk all the time. It is a very bad teaching method… I use this method all the way due to the limited time and preparation for taking a Joined College Examination. (T4 – 47-yr-old: Chinese)

One of the Chinese teacher believed that giving lectures was his strength of teaching:

> The most common strategy I employ is to give lectures. I seldom use group discussion ... It may be that I do not know how to lead group discussion... In this way, I can complete my lesson plan. I think I am suitable for giving lectures. (T20 – 39-yr-old: Chinese)

In this category, the teachers using lecturing focused on transferring knowledge to students with little concern for students' past experiences and understanding.

Category 2: Inquiry/questioning or activities

In the second category, teachers used inquiry, i.e., asking questions, and activities to help students understand the concepts and the relationships between them. It differs from Category 1 because students in this category were seen to gain knowledge through active engagement in the process of teaching-learning. Here are three examples.

An English teacher employed activities to have interaction with her students and to enable them to engage in activities.

> I will give students more interesting activities closely related to their lives. For example, I will ask students' life experiences and use them to "make sentences" in class. Or I will give students five minutes to practice speaking English in class on Mondays and ask them to chat with each other about something special, sad, or interesting that happened last weekend. (T2 – 43-yr-old: English)

A teacher adopted asking questions to help students to engage in interaction with their teacher.

> The most common strategy I will employ is interactive teaching. I often use questions to recall students' past memory or experiences in the hope that they can connect their past experiences with new knowledge in the book... (T8 – 51-yr-old female: Chinese)

In this category, the teachers believed that students' prior knowledge, experiences, and understanding were seen as being important in the process of acquiring concepts of the subject and that the teachers retained responsibility for the teaching-learning situations.

Category 3: Discussion

In the third category, the teachers employed discussion to stimulate students to think and understand. They believed that knowledge was progressively constructed by students on the basis of what they already knew. For example, a teacher of social studies tried to raise some controversial issues for students to think about, discuss, and express their opinions.

> … After lecturing, I will have discussions. I will raise some issues or different viewpoints and then ask students to think, discuss and make a judgment… I will let students express their opinions. (T15 – 34-yr-old: social studies)

A maths teacher held the view that group discussion could aid her students to construct maths concepts in class and after class.

> The most common strategy I employ in teaching is group discussion… It is because there is a gap between the language the teacher use and that the student use. So I teach group leaders some concepts of maths beforehand and then I ask group leaders to use their own language to explain concepts to their group members in the hope that those group members can understand concepts easily... Another reason is that after class, teachers are far away and if students have problems, they can ask their classmates for aid. In doing so, students can discuss together and learn actively. ..Maths and science subjects need students to discuss because every student has different understanding of these subjects. Through discussion, students can learn from each other and they themselves are resources for one another … (T9 – 43-yr-old: maths)

In category 3, the teachers believed that it was what the student did, not what the teacher did that determined what the student learned. The teacher structured teaching and learning situations in which students were encouraged to accept responsibility for their own learning.

7.1.4 Differences in conceptions of teaching methods of instruction between teachers across subjects

The following illustrates the main findings of differences in conceptions of teaching methods of instruction between Chinese, English, social studies, maths, and science teachers (see Appendix 7.4 for details of the frequency of each category).

Lecturing was the most frequently voiced category of conceptions (27 teachers), and was thus the dominant teaching method of instruction employed by these teachers. Despite this, more Chinese, English, and social studies teachers in soft areas made reference to the conception of teaching methods of instruction as inquiry or activity than maths and science teachers in hard areas. These results are consistent with Neumann and Becher's (2002) claim that teaching methods in pure soft areas stress a formative process of knowledge-building and teaching activities are largely constructive and interpretative.

It is worth noting that over half of the teachers reported only one conception of teaching methods of instruction. This suggests that the great majority of the teachers in this study had a tendency to confine themselves to one category, mainly lecturing.

7.2 Conceptions of learning

This section presents the results and analysis concerning the student's role, good learning, and individual differences in learning. As there is some commonality between the categories of conceptions of the student's role and good learning, a summary of the categories of good learning is provided, followed by the categories of individual differences in learning.

7.2.1. Good learning

Good learning in this study refers to those aspects of good learning which are meaningful to Taiwanese teachers, i.e., what these teachers personally think good learning should be.

Five substantively different ways of good learning were identified. Good learning was conceived as (1) the acquisition of knowledge and application, (2) good academic performance, (3) the development of ability, (4) active and independent learning, and (5) the development of good character.

Category 1: Good learning as the acquisition of knowledge and application

Within this category, good learning was viewed by teachers as a process of understanding and internalising knowledge and further applying it to their lives. For instance, three teachers described good learning in this way:

> Students have to digest knowledge they learn and internalize that knowledge. Next, students have to apply what they learn to their lives. (T23 – 48-yr-old: science)
>
> A student should know the basic structure of each lesson... They also should apply logics of maths to their lives. Without application, knowledge will not become part of their lives. (T28 – 27-yr-old: Chinese)
>
> Students can get a full understanding of what they learn and use it to solve the problems of their subjects and their lives. This way, students can change the quality of their lives. (T6 – 49-yr-old: Chinese)

These comments show that good learning was seen as acquiring knowledge and being able to apply it to analogous problems and situations, and also to use it to improve the quality of their lives.

Category 2: Good learning as good academic performance

Good learning in this category was referred to as having high academic achievement. Learning is a way to attain qualifications to achieve the targets of institutions and examinations. The following five selected quotes were found in the introductory parts of the interview transcript, indicating that the teachers viewed good academic achievement as the most significant element of good learning.

> First, it is good grades. (T27 – 30-yr-old: English)
>
> One is that students get good grades. (T12 – 51-yr-old: social studies)
>
> To have high exam scores is the most important thing. (T1 – 45-yr-old: science)
>
> First, students get good grades in the school. (T7 – 40-yr-old: maths)

One science teacher gave Albert Einstein as an example of good grades indicating the outcomes of good learning.

> One is good grades. If students do not have good grades, their learning is not good. The development of science has been 400 years. If students cannot get good grades in the school, they will not have achievement. Albert Einstein got good grades in his senior high school and the university but he does not like his school teachers' way of teaching. (T24 – 36-yr-old: science)

Students in this category were regarded as dutiful or responsible learners who should do their duty to study hard. Two teachers expressed their views of the role of the student as follows:

> They should study hard and make every effort to learn knowledge in the textbook. (T12 – 51-yr-old: social studies)

> …be attentive in class, to ask teachers questions, and to complete assignments. They also need to study in accordance with regular assessments implemented by teachers. ..If students can complete all things their teacher ask them to do, they do their duties. (T13 – 45-yr-old: science)

Here it could be said that these teachers viewed good learning from an external perspective. High scores on the exam papers were equivalent to good learning. The students needed to do their duty, especially to study hard. This may be based on the high value placed by Confucian Chinese culture on effort, which is considered a very important attribute of a person's success, especially for academic achievement (Chan & Elliott, 2004).

Category 3: Good learning as the development of students' ability

This category is based on the view that good learning was not confined to the teaching content but to a process of the development of students' ability.

> They also have to develop their ability to learn new things. (T9 – 43-yr-old: maths)

> Students can cultivate the ability of integration... The Joint College Entrance Examination contains all syllabuses in five textbooks. Students need to integrate all definitions, concepts and formulas and then they will know how to answer questions on the test. (T16 – 51-yr-old: maths)

> I highly emphasize that students should have the ability to think. When students learn maths, they have to think… (T22 – 47-yr-old: maths)

> Students have the ability to solve problems, and know the methods of thinking. Students know to think a problem from different perspectives and from the easy question to the difficult one, even give examples... They will encounter new questions in the future. So now they have to learn the correct way of thinking and to develop the ability to solve problems. (T29 – 46-yr-old: science)

The role of the student was seen as a person who thought critically. One quote illustrates this:

> They have to think hard after school… students have to think independently. I often tell students that they have to argue with their teachers about academic questions. Teachers are "the same generation" as students. Teachers and students can discuss together. (T24 – 36-yr-old: science)

Here it is clear that good learning was seen as students' acquisition of different types of ability, such as the ability to think, the ability to integrate, the ability to solve problems in order to study, to work, and to cope with problems in their future lives.

Category 4: Good learning as involving active and independent learning

Within this category, good learning was seen as students learning actively and independently. For example, teachers talked about students actively asking questions as an indicator of good learning.

> Students have to learn actively so that they can learn more... If they have questions, they need to actively ask their classmates and teachers. This kind of people learns the most because they know how to learn well. (T8 – 51-yr-old: Chinese)

> Students have independent and autonomous learning... I think students themselves should ask questions actively. (T3 – 40-yr-old: English)

Two teachers mentioned that good learning meant that students had to monitor their learning and could study on their own in their spare time.

> Students should discuss with teachers, and ask questions if they do not understand. Also, they have to check the process of learning and find out which part they do not understand. After that, study actively and efficiently and know to grasp key points... What's more, students must have passion for learning. They should listen to English songs and read English novels in their free time. (T17 – 30-yr-old: English)

> If students can self-study, it is good learning. There are only two hours per week for me to teach geography. Students have to learn actively so that they can integrate what they learn. (T10 – 46-yr-old: social studies)

The role of the student within this category was seen as an active learner. For example, one teacher wanted students to take the initiative in learning and to construct their own knowledge:

> Students should seek knowledge and ask questions actively, discuss with his classmates. (T17 – 30-yr-old: English)

Another two teachers wanted students to extend knowledge beyond the textbook.

> They should learn actively and are willing to learn. Besides, they should have an ambition for learning so they can learn something beyond textbooks. (T9 – 43-yr-old: maths)

> Students should play the role of active learners. They must be passionate for knowledge. Moreover, they have to read more outside reading in addition to knowledge in the textbook. (T23 – 48-yr-old: science)

These comments show that good learning was viewed as a process in which the learner actively constructed new ideas or concepts based upon current and past

knowledge or experiences, and that students' autonomy was the driving force. These results are consistent with Pratt's (1992b) claim that knowledge is personally constructed, and that learning is an on-going process of reflection which continues well beyond the temporal and geographic boundaries of formal education.

Category 5: Good learning as the development of good character

The conception in this category saw good learning as being closely related to the development of students' good character. For instance, an English teacher expressed her understanding of good learning resulting from good attitude.

> Good learning is attitude. There are individual differences in aptitude. But with good attitude, students will make gradual progress no matter who has great or little aptitude for learning school subjects. Good attitude will lead to progress. (T2 – 43-yr-old: English)

Another teacher viewed good learning as the relation between good conduct and a good learning environment, which was seen as facilitating good learning outcomes.

> Another is cleanness and order in the classroom. If students do not emphasise their appearance (classroom cleanness), they cannot learn well. As for order in class, I want students to do the right thing at the right time, i.e. to be accountable for their behaviour... The purpose of cleanness and order in the classroom is to provide a good learning environment for students. (T19 – 30-yr-old: Chinese)

One science teacher asserted that it was students' attitude, such as perseverance, persistence, and efforts, not aptitude that contributed to good learning outcomes.

> Another is that students must have perseverance and persistence. Science is not contributed to by smart people. There are few smart people who make contributions to science, but people with great efforts make contributions to science. I tell students effort is something that you can control. (T24 – 36-yr-old: science)

The student in this category was viewed as a person who should develop his/her character in addition to knowledge acquisition. For example, one teacher considered it important for students to learn gratitude.

> Another is that he has to show gratitude. Each time a student can answer my question, I always say, "Thank you for your former Chinese teachers. They taught you this idea. With the help of many people, now you are sitting in this classroom. You should know gratitude. Still another responsibility is to treasure blessings. (T4 – 47-yr-old: Chinese)

One teacher emphasised students showing concern for the feelings of their teachers and parents and cultivation of a sense of honour and responsibility.

> Besides, they should consider teachers' feelings. Students have to respond to teachers' teaching and let teachers feel they are learning. ..Furthermore, they must have a sense of honour and responsibility, and empathy. Finally, they should show filial obedience or devotion for their parents. Parents send you to the school and you have to study hard in order to repay them. (T14 – 49-yr-old: maths)

Here, it could be said that a student's good character, such as a good attitude toward parents, teachers, learning, and effort, is conducive to good learning outcomes. The teachers' views echoed Confucius' belief that the most important purpose of human life is social and moral self-cultivation, which constitutes the core meaning of learning (Li, 2012). Thus, this conception is relevant to the fact that the main focus of Confucian learning is to become a man of character through the practice of good conduct (Shim, 2008).

7.2.2 Differences in conceptions of the student's role and good learning across subjects

Differences in conceptions of the student's role and good learning across subjects are presented below.

7.2.2.1 The role of the student

The findings of conceptions of the role of the student (see Appendix 7.5A for categories of the role of the student and Appendix 7.5B for details of the frequency of each category) show that the most dominant conception of the student's role reported by Taiwanese teachers was 'dutiful or responsible learner'. This suggests that being a dutiful or responsible student was greatly emphasised by Taiwanese senior high school teachers.

These findings are similar to Pratt's (1992a) study, which learning was viewed as fulfilment of responsibility to society among Chinese adults. This may be influenced by traditional Chinese culture, in which standards for self-development do not stem from some idealised sense of personal autonomy but from societal roles, i.e., a sense of duty and a moral sense of obligation (Pratt, 1992a).

The results also reveal that maths and science teachers tended to view the role of the student as 'dutiful or responsible learner', indicating that maths and science teachers may think that it is students themselves, not teachers who have to take more responsibility for learning. This suggests that they might not feel ashamed if their students perform poorly.

It is worth noting that more Chinese teachers referred to the conception of the student's role as 'development of character' than teachers of the other four subjects. Additionally, social studies teachers, in particular, tended to see the student's role as an active and independent learner. This could be explained by the findings of Donnelly's (1999) study, that many history teachers believed that historians tried to place children's interpretations and intellectual judgments at the centre of their work.

7.2.2.2 Good learning

Findings of conceptions of good learning (see Appendix 7.6 for details of the frequency of each category) show that the most widely identified conceptions of good learning were 'active and independent learning', followed by 'the development of good character'. Chinese, English, and social studies teachers in soft areas tended to view good learning as 'involving active and independent learning'. This reflects that teachers in soft areas in the present study tended to place greater importance on broad general knowledge and on effective thinking skills such as critical thinking (Braxton, 1995).

It is interesting to note that the overwhelming majority of maths and science teachers in hard areas referred to good learning as the 'development of students' ability', whereas none of the teachers in soft areas reported this view. This suggests that teachers in hard areas in this study tended to enhance the students' powers of logical reasoning, especially their ability to apply principles and methods (Neumann & Becher, 2002; Hativa, 1997).

7.2.3 Conceptions about individual differences in learning

Individual differences here are described as those aspects in which individuals differ in information processing, meaning construction, and application of this information and meaning to new situations, as perceived by Taiwanese teachers.

Six qualitatively different conceptions of individual differences in learning were found. Individual difference was conceived as (1) ability, (2) motivation or attitude, (3) learning style, (4) personality, (5) gender difference, and (6) group difference.

Category 1: Individual differences in ability

In this category, ability was seen as the learner's ability to understand instruction and what was required of him in learning situations. The following quotes illustrate that some teachers held a view that students needed a particular talent for learning some subjects.

> Some students have a talent for maths and they can immediately understand what you teach. Some students study hard but do not get good outcomes. Therefore, learning maths still needs talent and understanding. (T7 – 40-yr-old: maths)

> There are differences in understanding and talent. Learning physics needs students who have talent for it. (T13 – 45-yr-old: science)

A maths teacher further pointed out that talent, not effort, was required for studying maths well.

> Some students have an interest in maths and they can learn fast. But if students do not have an aptitude for maths, they cannot study maths well even though they study very hard. (T22 – 47-yr-old: math)

One teacher mentioned that students' different abilities affected their understanding of the subject.

> Another difference is their ability to learn English. Some are proficient in English while some have difficulty in learning English. (T2 – 43-yr-old: English)

Here, it is clear that students were seen as needing a certain ability to learn maths and science. This may be based on the teachers' naive epistemological beliefs that knowledge is simple, clear and specific, and that concepts are learned either quickly or not at all, and that learning ability is innate and fixed (Schommer, 1994).

Category 2: Individual differences in motivation or attitude

The conception that students learn differently was referred to as their different motivation or attitude toward learning. For example, two English teachers described the different ways in which students study in levels of motivation.

> Students have different motivation. Some students find their goals and study hard. For example, some students are interested in finance and they study English earnestly. (T27 – 30-yr-old: English)

> The motivation of students is different. Some students are highly motivated and consider English is very important for them. Some students are poorly motivated. (T5 – 48-yr-old: English)

Another teacher talked about students' different attitudes toward learning, and how these affected their intention to take action or not.

> Students have different attitude toward learning: some students are enthusiastic about learning. When they encounter problems, they will try to solve them. Some students are passive and do not solve problems. (T23 – 48-yr-old: science)

Here it could be said that individual motivation or attitude is closely related to students' intention to study.

Category 3: Individual differences in learning style

The conception in this category saw individual differences in learning as learning style. For instance, three teachers expressed their understanding of students' learning differences as follows:

> Some are visual learners; some need to do "hand-on" activities with materials (tactile learners); some are auditory learners. (T14 – 48-yr-old: English)

> Some students can remember content by watching movies. Some need to study by listening to stories. Some like to learn by discussing. Some like to study alone while others like to have cooperative learning. (T3 – 40-yr-old: English)

> Students receive information through different channels. Some students learn through the eye - seeing... Some are sensitive to voices. Some like to operate… learning by doing "hands-on" activities… (T11 – 31-yr-old: science)

These comments show that each student had his or her preferred way(s) of absorbing and retaining information and skills. Namely, students received information and skills in different ways, such as seeing, hearing, touching, learning alone, and working with others.

Category 4: Individual differences in personality

Within this category, individual differences in learning were seen as students' personality. Two quotes illustrate this:

> Students have different personalities. Some students are outgoing and some are shy. For those who are extrovert, I will ask them not to chat in class and make them quiet down. To those who are introvert, I will encourage them to answer questions. (T12 – 46-yr-old: social studies)

> Some boys are shy and want to save face. So if I make a mistake, I will make an apology to them. (T8 – 51-yr-old: Chinese)

Here it is clear that the students' different personalities, for example, introversion versus extroversion, were seen as affecting their studies, and also changed teachers' ways of responding to students.

Category 5: Gender differences in learning

The category is based on the view that gender influenced students' learning. For example, one teacher said that gender had an effect on students' levels of frustration in learning physics:

> Boys and girls are different in learning physics. Girls in the Taipei First Girls High School care about grades very much so physics becomes the source of their frustration… Male students in Xinzhuang high schools are outgoing. They will not feel so frustrated in learning physics… (T13 – 45-yr-old: science)

Two social studies teachers expressed that gender affected students' academic performance in different academic years:

> Generally speaking, girls in the first year study better than boys. In contrast, male students in the second and third year perform better than female students. (T15 – 34-yr-old: social studies)

> There is gender difference. Male students do not have motivation to learn if they do not have their goals. They do not get good grades in the first and second grade because they want to live a bright life. .. For female students, they are reserved and hide their desires... When male students have their goals in the third grade, they will study very hard. (T18 – 51-yr-old: social studies)

The teachers in this category noticed that gender influenced students' learning in terms of stress and motivation.

Category 6: Group differences in learning

In this category, groups were seen as a factor that influenced students learning. Three quotes illustrate this:

> There is a difference between 'social' streams and 'science' streams. Also there is difference between different classes within 'social' streams or 'science' streams...There are different atmospheres between classes. My own class is 'science' stream in which students are outgoing and like to answer my questions when I play games…In contrast, some students in 'social' streams are quiet and study hard... Students in some classes are lazy and we have no interaction. (T17 – 30-yr-old: English)

> There is a difference in different classes. I teach students in 'science' stream this year and taught students in 'social' stream last year. When I taught students (female students) last year, they would feel touched when I shared the beauty of literature with them. But this year, when I teach the same lesson, students (male students) in 'science' stream fall asleep quickly. (T19 – 30-yr-old: Chinese)

> Different classes have different learning patterns and atmospheres. Students in one class are "a little bit stupid" and they will follow my instruction to do exercise on the tests. In contrast, students in another class do not want to follow me and want to find shortcuts to improve their grades. (T27 – 30-yr-old: English)

The teachers in this conception held this view that students in different classes displayed different preferred way of learning and responded differently to teachers'

instruction due to their different group characteristics of students in each class, and different classroom culture and atmosphere.

7.2.4 Differences in conceptions of individual differences in learning across subjects

Despite small numbers in some categories (see Appendix 7.7 for the frequency of each category expressed by teachers across subjects), the points raised by these teachers are still worth analysing because they can illuminate other findings. Given there are many small differences, the following presents the main findings.

The most widely expressed conceptions of individual differences in learning were ‘ability’, followed by ‘motivation/attitude’, and teachers of all five subjects reported that students learned differently in these two conceptions. Findings reveal that maths, science, and English teachers noticed individual differences in ‘ability’ in particular.

It is interesting to note that apart from one science teacher, who mentioned ‘gender’ differences in learning, none of the math and science teachers observed individual differences in the categories ‘personality’, ‘gender’, and ‘group’. This suggests that Chinese, English, and social studies teachers in soft areas were likely to be more aware of variations in individual differences in learning than maths and science teachers in hard areas.

7.3 Overall summary

The following is a summary of the results of interview data analysis. The categories of conceptions of teaching and learning are summarised in Table 7.8. In addition, a comparison of conceptions of teaching and learning between teachers in hard areas and those in soft areas is provided in Table 7.9.

Table 7.8 shows the categories of conceptions of teaching and learning that have emerged from this study.

Table 7.8

Summary of Conceptions of Teaching and Learning

Conceptions of teaching						
	Content-centred		**Learning-centred**			
Teacher role	Knowledge transmitter	Role model	Facilitating students' learning		Developing students' character	Nurturing students
Teaching	Transmitting knowledge in the textbook or curriculum	Modelling ways of being	Mutual learning	Facilitating learning	Development of students' character	
Good teaching	Transmitting knowledge in a comprehensible way	Good academic performance	Joyful teacher-student interaction	Active and independent learner	Development of students' character	
Teaching method of instruction	Lecturing		Inquiry or activity	Discussion		
Conceptions of learning						
	Content-centred		**Learning-centred**			
Student role	Passive receiver	Dutiful or responsible learner	Active learner		Developing character	
Good learning	Acquisition of knowledge and application	Good academic performance	Development of ability	Active and independent learning	Development of good character	
	Individual differences				Gender differences	Group differences
Individual difference	Ability	Motivation or attitude	Learning style	Personality	Gender	Group

In Table 7.8, the conceptions of teaching and learning that emerged from the interview data are placed under two broad orientations. The first orientation is content-centred teaching and learning, and focuses on the transmission of defined bodies of knowledge or content. The second orientation is learning-centred teaching and learning, and centres on the student's learning. With regard to individual differences in learning, six categories emerged.

Table 7.9 presents a comparison of hard subject and soft subject teachers' conceptions of teaching and learning.

Table 7.9

Comparison of Conceptions of Teaching and Learning between Maths and Science Teachers in Hard Areas and Chinese, English, and Social Studies Teachers in Soft Areas

	Teachers in hard areas	**Teachers in soft areas**	**Comments**
Teacher role	They tended to view the teacher's role as 'transmitter of knowledge'.	They tended to view the teacher's role as 'facilitator' and 'role model'.	None of the maths teachers viewed the teacher's role as 'role model'
Teaching	They were inclined to see teaching as 'transmitting knowledge'.	They were inclined to see teaching as 'mutual learning' and 'facilitating learning'.	None of the maths teachers saw teaching as 'facilitating learning'.
Good teaching	Science teachers tended to view good teaching as 'facilitating students to become active and independent learners'.	English teachers tended to view good teaching as 'helping students to get good grades'.	None of the maths and science teachers viewed good teaching as 'helping students to shape their character'.
Teaching methods of instruction	They were apt to use 'lecturing' as their dominant teaching method of instruction.	They were apt to combine 'lecturing' and 'inquiry or activity' as their most commonly used teaching method of instruction.	
Student role	They tended to see the student's role as 'to be a dutiful or responsible learner'.	Social studies teachers in particular tended to see the student's role as 'an active and independent learner'.	Chinese teachers tended to see the student's role as the 'develop their character'.
Good learning	They tended to view good learning as the 'development of the student's ability'.	They tended to view good learning as 'learn actively and independently'.	None of the Chinese, English, and social studies teachers viewed good learning as the 'development of student's ability'.
Learning difference	They were more aware of students learning differently in two categories: 'ability' and 'motivation or attitude'.	They were more aware of students learning differently in five categories: 'ability', 'motivation or attitude', 'personality', 'gender', and 'group'.	Maths, science, and English teachers were more aware of students learning differently in one category: 'ability'.

The main findings shown in Table 7.9 are summarised below:

- In terms of the teacher's role and teaching, maths and science teachers tended to see the teacher's role as 'transmitter of knowledge'. They tended to view teaching primarily as the transmission of knowledge and learning as the acquisition and reproduction of knowledge. In contrast, Chinese, English, and

social studies teachers tended to view the teacher's role as 'facilitator' and 'role model'. They were apt to see teaching as 'mutual learning' and 'facilitating learning'. It is interesting to note that there was a high commonality between teachers in soft areas and those in hard areas: they tended to place high value on the development of the student's character.

- With regard to good teaching, English teachers were inclined to view 'good academic performance' as evidence of good teaching. Science teachers were inclined to view 'facilitating students to become active and independent learners' as good teaching. None of the maths teachers spoke of 'developing students' character' as good teaching, although many of Chinese teachers did.

- In terms of teaching methods of instruction, maths and science teachers were inclined to use 'lecturing' as their dominant teaching method of instruction. Chinese, English, and social studies teachers were apt to combine 'lecturing' and 'inquiry' as their most commonly used teaching methods of instruction.

- Maths and science teachers tended to view good learning as 'the development of the student's ability'. In contrast, Chinese, English, and social studies teachers tended to view good learning as 'students' active and independent learning'.

- Broadly speaking, maths and science teachers were less aware of variations in individual differences in learning than Chinese, English, and social studies teachers.

Chapter 8

Discussion of Qualitative Findings

This chapter is divided into three major sections. The first section deals with conceptions of teaching and learning and differences in conceptions of teaching across five subjects. The second section discusses conceptions of teaching methods of instruction and differences in conceptions of teaching methods of instruction across disciplines. The third section describes conceptions of individual differences in learning and differences in conceptions of individual differences in learning between teachers of hard areas and those of soft areas. The final section summarises the overall discussion of the quantitative and qualitative findings.

8.1. Conceptions of teaching and learning

The qualitative findings that two broad school teachers' orientations, i.e., content-centred and learning-centred and five conceptions of teaching and good learning emerged, mirrored those of earlier studies of university teachers' reference. They range from a focus on transmitting knowledge and skills, developing basic understanding, developing personal meaning and understanding, to the student changing as a person.

The results of the analysis indicate that although no teachers made reference to all conceptions of teaching and learning, teaching methods of instruction, or individual differences in learning, the majority of teachers reported two or three, one of which was usually dominant over the others. This finding confirms that a teacher can hold multiple conceptions of teaching and learning, as proposed by a number of previous studies (e.g., Pratt, 1992; Boulton-Lewis et al., 2001; Gao & Watkins, 2002). In addition, conceptions of teaching and learning were not entirely subject-related in the sense that some teachers had conceptions of teaching and good learning which were shared by teachers in other subject areas. This is in line with the findings of Dall'Alba's (1991) study on university teachers.

8.1.1. Conceptions of teaching

By and large, there was a close relationship between how teachers saw their role and how they viewed teaching. For example, a teacher who viewed teaching as

providing a learning environment saw her role as designing a learning environment. The following discuss five conceptions of teaching and the teacher's role in detail.

8.1.1.1. Transmitting knowledge

Of these five conceptions, 'transmitting knowledge' is the most widely identified conception of teaching among Taiwanese senior high school teachers. This is consistent with the findings in the literature albeit by different names such as 'transfer theory' (Fox, 1983), 'presenting information' and 'transmitting information' (Dall'Alba, 1990), 'delivering content' (Pratt, 1992a, 1992b), 'knowledge transmission' (Gow & Kember, 1993), 'imparting information' and 'transmission of knowledge and attitudes to knowledge' (Samuelowicz & Bain, 1992), 'transmission of content/skills' (Boulton-Lewis et al., 2001), and 'knowledge delivery' (Gao & Watkins, 2002).

Despite subtle differences in these labels, central to this conception is the idea that teaching is perceived as transmitting the information/knowledge/skills described in the syllabus or textbooks from a teacher to students. Knowledge is believed to be relatively stable and external to the learner (Pratt, 1992a). The role of the teacher is to impart that knowledge to the student, and the student is seen as a passive recipient of a body of content (Kember, 1997). The finding that the majority of Taiwanese teachers viewed the role of the teachers as "transmitter of knowledge' is consistent with previous studies (e.g., Harden & Adams, 2000; Zuljan, 2007).

The conception that 'transmitting knowledge' was the most commonly expressed conception of teaching by the participants may be reflective of historical, cultural, and social factors. Chinese culture places great emphasis on the value of knowledge, especially book knowledge, which is seen not only as fostering students' ability but also as developing their moral character and behaviour (Gao, 1998). Besides, one of the roles of the teacher in Chinese tradition is that "A teacher is the one who… teaches you knowledge". This has such a deep influence on Taiwanese teachers that they may view the role of the teachers as "transmitter of knowledge' (Liu, 1973, p. 754).

In addition to Chinese cultural influence, Western values in knowledge of the physical or external world may also influence these teachers' views on teaching as 'transmitting knowledge', especially for maths and science teachers. Western

influences may be dated back to the late-Quing Dynasty, after which scholars endeavoured to integrate Western thoughts, especially democracy and science, into Chinese philosophies in the May Fourth New Cultural movement in 1916 (Pan & Yu, 1999). Taiwan, to which the central government of Chiang Kai-Shek moved after the communist's takeover of the mainland in 1949, has also been greatly affected by the Western culture after the lifting martial law in 1987.

Such influences are reinforced by a great number of people who went to the US for advanced study, obtained their higher degrees, and occupied decisive positions in the government as well as in the universities. It follows that universities teachers, especially in the hard areas, in the public normal universities might have a great impact on student teachers' views and assumptions on teaching and learning. This may lead to teachers' tendency to see teaching as transmitting knowledge.

Furthermore, the educational context in the modern era in Taiwan has a tremendous impact on the thought of teachers. For example, according to Leung (2001), curricula in East Asian countries are content oriented and examination driven. Classroom teaching is usually conducted in a whole class setting. Teachers appear to think that subject-matter competence is sufficient for the effective teaching of the subject and to be ignorant about the latest methods of teaching. Teachers and students are thus subjected to excessive pressure from the highly competitive examinations (p. 35-36). In brief, these contextual factors, Chinese culture and Western culture, may foster Taiwanese school teachers' inclination to regard teaching as transmitting knowledge.

8.1.1.2 Mutual learning (to teach and to learn)

The result that 'mutual learning' was the second most frequently voiced conception of teaching was contrary to my expectation. The concept may have originated not only from Confucius' concept of learning in which learners improve themselves by teaching as well as studying, but also from his idea that teaching aids self-cultivation, based on the fact that he cultivated himself by constantly studying and teaching (Shim, 2008).

For instance, when there is a discrepancy between what teachers teach and what students really understand in the process of teaching, teachers realise that they may lack some knowledge or skills. Or when dealing with students' behavioural

problems in class, they may come to realise that they have some negative attitudes or a volatile personality. At those moments, teachers will reflect on themselves and try to increase or broaden their knowledge, sharpen their teaching skills, or make efforts at self-cultivation. In short, teaching not only helps students to grow but also encourages teachers to seek self-cultivation (Shim, 2008).

The conception of 'mutual learning' in this study is congruent with two theoretical studies, by Freire (1998) and Yayli (2009). Freire (1970) states that the role of teachers is to know the reality of their role as a co-investigator. If teachers show students that they will not teach them directly but will learn with them, then the students will understand their autonomous role of investigating in some teaching activities (Freire, 1998). In Yayli's (2009) study, one of the new roles for literacy teachers is as co-inquirer or border-crosser, which stresses the fact that teachers are learners who continuously develop themselves in their teaching (Giroux, 1992). These three studies share the belief that teachers and their students influence each other by means of the interconnected teaching and learning activities.

8.1.1.3 Modelling ways of being (role modelling)

The third conception of teaching as 'modelling ways of being' corresponds to Pratt's (1992a) apprenticeship conception following his study of China, Hong Kong, and Singapore. Here, the teacher is understood as exemplifying the values and knowledge that the student must learn. The studies of non-Eastern contexts by Guerrero and Villamil (2002) and Oxford et al. (1998) conclude similarly, regarding the teacher as a gatekeeper who transmits the cultural heritage of the society to the students, i.e., cultural transmission. Furthermore, the notion of the teacher as a role model in some ways corresponds to Harden and Crosby's (2000) study, according to which one of the twelve ideal roles of a good clinical educator is that of a role model. They emphasise that "being a role model is widely recognised as critical in shaping, teaching, coaching and assisting future clinicians as it is the most powerful teaching strategy available to clinical educators" (McAllister et al., 1997, p.53, cited in Harden & Crosby, 2000).

The concept of teacher as role model is in keeping with a long Chinese tradition. Yang (53 B.C. – 18 A.D.), in the classic Fa Yan (法言), defined a teacher as 'the model for others'. Accordingly, teachers in Chinese society are expected to act as

role models (Gao, 1998; Gao & Watkins, 2002; Shim, 2008), and it is expected that values and knowledge are embedded in the actions of the teacher; that is, knowledge is passed on through role modelling (Pratt, 1992a). This may be derived from the influence of Confucian culture, since Confucius' teachings were mirrored in his own life (Shim, 2008). Confucius emphasised that his every act and word in his daily life were the exemplification of his teaching (ANC 7:23)[3] and thus in Confucius' teaching, there is a modelling relationship between the model (Confucius) and the modeller (disciple) in which his followers do their utmost to modify their behaviours to that of Confucius (Hall & Ames, 1987).

In short, role modelling is one of the most powerful means of transmitting values, attitudes, and patterns of thought and behaviour to students (Bandura, 1986). This conception of teaching is anchored in cultural, social, and historical realms of meaning (Pratt, 1992a).

8.1.1.4 Facilitating learning

The conception of teaching as 'facilitating learning' also emerged from the present study and is in line with the finding of previous studies, although it was often employed using different labels, such as 'travelling theory' (Fox, 1983), 'facilitating understanding' (Samuelowicz & Bain, 1992; Kember, 1997), 'organising learning environment' (Martin & Ramsden, 1992), 'learning facilitation' (Gow & Kember, 1993; Kember & Gow, 1994), and 'facilitation of understanding' (Boulton-Lewis et al., 2001). In spite of slight differences in these names, they all imply the facilitation of the development of understanding or knowledge. Here, teaching is viewed as a process of helping students towards desirable outcomes (Kember, 1997).

A great majority of Taiwanese senior high school teachers did not make reference to the conception 'facilitating learning'. A feasible explanation could be due to these teachers' learning experiences. That is, they had all experienced success in the existing, i.e., traditional educational environment (Trumbull & Slack, 1991). For this reason, they might have failed to develop concepts as facilitating students' learning and understanding.

[3] The Analects and collected Commentaries (論語集註) are referred to as ANC in this study.

Confucian learning tradition may have some influence on these teachers' learning experiences in two ways. Firstly, unlike Western learners, who are encouraged to pose questions using various forms of self-expression because they have to study the external world and to challenge authority and the existing canon of knowledge, East Asian learners have been traditionally discouraged from speaking too much because silence is considered important in the realm of infinite wisdom (Li, 2012). This is clearly expressed by Lao Tzu's famous saying, "those who understand are not talkers; talkers do not understand" (Li, 2012, p. 53).

The other way is that before the Chi Dynasty, teachers in traditional teaching used to require students to memorise the Four Books and Five Great Classics in which content/knowledge was stable. Memorisation has always been an accepted way of learning, even when committing to memorizing things not totally understood (Liu, 1986, p. 80-82), because it is assumed that repetitive learning (memorisation), as a continuous practice with increasing variation, will lead to deep understanding (Marton, 1997). Since traditional teaching does not consider understanding important, it is considered that students do not need to question or challenge teachers or the existing knowledge. As such, knowledge that is open to question and to be interrogated does not prevail in Chinese traditional teaching, and nor does developing students' critical thinking.

These things may impede most Taiwanese teachers from developing a more constructionist view of teaching, i.e., helping students' active construction of meaning by facilitating critical student inquiry (Gage, 2009).

The teachers participating in this study who did express this conception may have been influenced by the lectures and discussion sessions on refresher courses which helped them reflect on their teaching experiences. For example, a biology teacher talked about how she changed her way of teaching after a refresher course on education:

> *In the past, teachers always spoke and only teachers understood the content but students could not fully understand it*…The teaching strategy I like most now is to give students an ambiguous question to think and debate, hoping to challenge them... It is because I changed my ideas of teaching after I took a refresher course on education. The professor asked us a question, "Why does the earth block the sunlight?" Then he wanted us to choose one answer. Half of teachers got the wrong answer. The question was so easy that even elementary school students could answer it but half of teachers who graduated from NTU (the first top university) had the wrong answer. These teachers were very good at the written test. *This made me think*

> *the process of our learning had something wrong*. We teachers give lectures but seldom ask students to think. (T-21 – 40-yr-old: science)

Briefly, the result that 'facilitating learning' was referred to by only a small number of the participants may be due to their learning experiences at school as a result of the traditional teaching prevalent in Confucianism.

8.1.1.5 Developing students' character

An emphasis upon 'developing students' character' is consistent with the findings of three previous studies undertaken in China. According to Pratt's (1992a) study, Chinese scholars as well as Chinese adult educators held a conception of teaching as the development of character. Likewise, Gao and Watkins (2001, 2002) revealed that secondary school physics teachers in China viewed teaching as 'attitude promotion' and 'conduct guidance'. These findings are also similar to the results of two studies conducted in Western countries. Boulton-Lewis et al. (2001) found that secondary school teachers in Australia referred to teaching as the transformation of learners, while Fox (1983) indicated that growing theories of teaching emphasised 'what is happening to the student as a person' (p. 158).

The commonality of these Chinese and Western studies is that all teachers viewed teaching as the transformation of the learner as a person. However, there are subtle differences between them: teachers in China and Taiwan appear to place more emphasis on the moral character of learners, whereas those in Western countries seem to pay more attention to developing the learner cognitively, behaviourally, and affectively. The nuances of transformation of learners between the Chinese context and the Western context could be perhaps accounted for cultural differences. Such fine differences are reflected by a statement that as a whole, Chinese culture is characterised as being fundamentally moral and aesthetic, while Western culture is described as scientific, law-oriented, and religious, a distinction that was proposed by a contemporary Chinese educator, We-sen (Wu, 1979). Accordingly, it is not surprising that a great number of teachers in this study's interviews expressed the view that developing students' character was far more important than transmitting knowledge.

It is noteworthy that teachers at tertiary level in Western contexts appear not to have the same view of teaching (– as the transformation of learners) – as those teaching in schools, but university teachers put more emphasis on conceptual change

and intellectual development (Kember, 1997). A possible reason is that, in general, university students are relatively emotionally and behaviourally mature, which may make lecturers focus on their intellectual development. In contrast, school students are in the stage of the development of their body and mind, which may draw school teachers' attention to transform their students in three aspects – cognition, behaviour, and affect.

To sum up, three categories of conceptions of teaching – 'mutual learning', 'modelling ways of being', and 'developing students' character' – are directly explicable in the context of Taiwan. The conceptions 'transmitting knowledge' and 'facilitating learning' appear to be less obvious connections with cultural, social and historical factors in Taiwan.

8.1.2. Differences in conceptions of teaching across different academic subjects

The findings of this study illustrate variations in conceptions of teaching across disciplines. In general, teachers in hard disciplines were apt to view teaching as 'transmitting knowledge' and the teacher's role as 'transmitter of knowledge'. In contrast, teachers in soft disciplines were inclined to see teaching as 'mutual learning' and 'facilitating learning' and the teacher's role as 'facilitator' and 'role model'. These results are consistent with Lattuca and Stark's (1995) claim that hard fields underscore cognitive goals such as the learning of facts, principles, and concepts, whereas soft fields emphasise these same goals but also attach importance to effective thinking skills such as critical thinking. Although there are many small differences, those major differences which did emerge are described in the following sections.

8.1.2.1 Teaching in hard areas viewed as 'transmitting knowledge' and the teacher's role as 'transmitter of knowledge'

The study found that maths and science teachers tended to view teaching as 'transmitting knowledge' and the teacher's role as 'knowledge transmitter'; this is consistent with two studies undertaken in Western countries. Firstly, according to Aguirre et al.'s (1990) study, almost 50% of pre-service secondary science teachers in Canada held the view that teaching was a matter of knowledge transfer from the teacher's mind and textbooks to the 'empty' minds of children, and that teachers were primary sources of knowledge. Secondly, Donnelly (1999) pointed out that secondary

school science teachers in England and Wales placed a strong emphasis on established knowledge and perceived uncertainty as threatening.

Results of the current study are also similar to those of Tsai's (2002) study, in which most secondary school science teachers in Taiwan expressed traditional views and believed that science was best taught by transferring knowledge from teachers to students. However, the findings are contrary to those of two other studies, in which secondary science and maths teachers viewed teaching as ranging from the development of skills and understanding to the facilitation of understanding (Boulton-Lewis et al., 2001; Patrick, 1992).

In this study, science teachers often presented traditional views of teaching, which might be derived from their past learning experience – they had all experienced success in the existing, traditional, and educational environment (Tsai, 2002; Trumbull & Slack, 1991). Another possible explanation may be that these teachers had a belief that science was unproblematic, authoritative, established factual material. One science teacher expressed such a belief:

> ⋯because knowledge in the textbook is lots of formulas, definitions, and laws which have been established by scientists for more than one or two hundred years… laws, formula, and definitions in science are definite and clear and it is hard for you to explore the theory built up by Einstein... That is, the way of thinking in science is vertical. For instance, the law of A leads to the law of B, and then the law of B leads to the law of C. These are the attributes of natural science. (T-1 – 45-yr-old: science)

This teacher's opinion reflects the fact that science has a foundation body of well-established knowledge (Kember & Leung, 2011) and that "school science is necessarily concerned with a world where scientific theories appear as given and certain" (Donnelly, 1999, p.33).

The finding that maths teachers were apt to view teaching as transmitting knowledge corresponds to Leung's (2001) study, in the content-oriented and examination-driven context of East Asian countries, in which teaching maths was very traditional, i.e., mathematics education focused on acquiring a body of knowledge and teaching was analogous to getting the body of knowledge across from the teacher to the student. This is similar to Demirbolat's (2006) finding that mathematics teachers approach their profession solely as a means of teaching the subject. Such emphasis on the mathematics content, procedures, or skills in the

mathematics classroom was clearly expressed by two maths teachers in the present study:

> Teaching maths is to deliver concepts in one unit clearly. Maths is composed of units. I will explain concepts in each unit clearly and ask students to do exercises. Teaching is to teach definitions, formula, and prove formula. It is a kind of thinking training to watch the proof of formula. (T-7 – 40-yr-old: maths)
>
> Teaching maths is to teach definitions from which develop a set of formulas. (T-16 – 48-yr-old: maths)

This may explain why Taiwanese maths teachers had an inclination to view teaching maths as "an accumulation of facts, rules and skills to be used in the pursuance of some external end" (Ernest, 1989, p. 254). This tendency is different from contemporary mathematics education in Western countries, which often focuses more on the process of doing mathematics rather than learning the mathematics content itself (Leung, 2001).

In short, teachers in hard disciplines had a tendency to emphasise instilling knowledge of well-established concepts through a predominantly didactic form of teaching.

8.1.2.2 Teaching in soft areas viewed as 'mutual learning' and 'facilitating learning' and the teacher's role as 'facilitator' and 'role model'

The findings that more Chinese, English, and social studies teachers than maths and science teachers tended to view teaching as 'mutual learning' and saw the teacher's role as 'role model' could be explained by the different degree of influence of the Chinese culture and Confucius' thoughts on teachers across different subjects. Teachers of Chinese, English, and social studies in this study were exposed to more Chinese culture and Confucius' thoughts than the teachers of maths and science when they were senior high school students.

This is explicable by educational specialisation in upper secondary education in Taiwan. Senior high school students are grouped into a 'social' stream and 'science' stream when they are in the second year. The curriculum in the 'social' stream focus more on subjects like Chinese literature, Chinese history and geography, and English, whereas the curriculum in the 'science' stream focus more on subjects like maths and science. It follows that students in 'social' stream are exposed to more influence of the Chinese culture and history than those students in the 'science' stream.

The findings that more Chinese, English, and social studies teachers than maths and science teachers viewed teaching as 'facilitating learning' and the teacher's role as 'facilitator' are in line with Kember and Kwan's (2000) study, which found that social sciences lecturers tended to view teaching as learning facilitation. Similar findings are also found in some studies at tertiary level and school level. In Hativa's (1997) study, soft areas in the university greatly emphasised creativity of thinking and oral expression. Lattuca and Stark (1994) and Braxton (1995) reported that soft fields emphasised certain types of cognitive goals - students were expected to enhance their powers of analysis and synthesis, and their critical thinking. Donnelly (1999) revealed that secondary school history teachers tried to place children's interpretations and intellectual judgments at the centre of their work. Nevertheless, the results of this study are different from those of Boulton-Lewis et al. (2001), who found that school teachers of second language referred to teaching as primarily involving the transmission of content or skills.

In contrast to knowledge in hard areas that is the quantifiable nature of phenomena, knowledge in soft areas may be viewed as contextual and concerned with human experience, rather than absolute; teachers in the humanities and social sciences place strong emphasis on fostering the intellectual and personal development of students (Lattuca & Stark, 1994). For example, a teacher of citizenship education described the following:

> The subject of civil (citizenship education) is highly associated with the society. After students learn the knowledge, they have to apply it to their daily lives, to identify with the social norm and systems, and thereby to have independent thinking. Students know to obey the existing social norm and systems and ponder the problems of these norms and systems. If possible, they can have their own opinions if the existing social norm and systems are inefficient or unjust. (T-7 – 34-yr-old: social studies)

Here it is clear that the teacher aimed to foster students' intellectual development – 'independent thinking'.

In short, the differences of conceptions of teaching between teachers in hard areas and those in soft areas in this study may be explicable in terms of cultural influences and disciplinary characteristics.

8.1.3 Conceptions of good teaching and good learning

The results from this study show that there is broad consistency between four of the conceptions of good teaching (transmitting knowledge, good academic

performance, active and independent learners, and developing students' character) and four of the conceptions of good learning (acquisition of knowledge and application, good academic performance, active and independent learning, and development of good character) but not for one of the conceptions of good teaching (joyful teacher-student interaction) and one of the conceptions of good learning (the development of students' ability).

The notion that students should become active and independent learners was the most commonly identified conception of good teaching and of good learning by the participants. Yet, these findings appear to contradict 1) traditional Confucian education to some extent, which emphasises moral and social self-cultivation and self-perfection, and 2) Chinese society's emphasis on collectivism, which defines the self as interdependent (Klassen, Al-Dhafri, Hannok, & Betts, 2011). One possible explanation may be that many respondents were influenced by the West, with its emphasis on individualism, which centralises the personal, such as personal goals, personal uniqueness, and personal control, and promotes individual independence (Oyserman et al., 2002).

Nevertheless, it is interesting to note that 'good academic performance' was the second most mentioned conception of good teaching.

This may be due to the high values placed on examinations by the public and the society. The emphasis on examinations is deeply rooted in the Chinese culture in which the 'Ke Ju' system (a national examination system) was instituted in 606 A.D. (Gao, 1998). Examinations have been regarded as a fair method of differentiating between the able and the less able in the Chinese culture (Leung, 2001). This well-known phenomenon still prevails in Taiwan. Parents in Taiwan are very keen on the results of schooling, especially the exam marks of their children. In addition, student records in Joint College Entrance Examinations are regarded as the most important or even the only indicator of the quality of schools. That is, good academic performance is a source of motivation for teachers to demonstrate that their students have achieved knowledge.

It is not surprising that many teachers take external evaluation as a key criterion and students' academic performance as the most reliable indicator of successful teaching. The finding is similar to that of Gao's (1998) study, which

revealed that two- thirds of school science teachers in China said that their highest expectation for the student was that they got high marks in public examinations. This illustrates that for many teachers, both in China and in Taiwan, teaching is viewed as a process of accomplishing an institutional target (Gao, 1998).

8.1.4 Differences in conceptions of good teaching across different academic subjects

The results of the current study reveal variation in conceptions of good teaching between teachers across five subjects. The following section discusses respectively the major differences in conceptions of 'good academic performance' and of 'active/ independent learner' between teachers across subjects.

More English teachers were inclined to see good teaching as 'good academic performance' than teachers of the other four subjects, which implies that they may encourage students to work hard by relying mostly on external motivators, such as the importance of their examination marks (Kember & Kwan, 2000). This finding suggests that English teachers might tend to have external regulation toward teaching. One possible explanation for this is that effective second language teachers are typically defined as "those whose students perform better on standardized achievement tests" (Freeman & Richards, 1993, p. 198).

Another is that the general public and the society in Taiwan place high value on English and regard English as a tool for access to a successful future due to its significant importance to advanced study, job opportunities, or promotion. Under the influence of such forces, it is not surprising if English teachers themselves had the desire to learn English to achieve some instrumental end (practical goals) when they were students. These learning experiences may have an impact on English teachers' conceptions of teaching, just as Freeman and Richards (1993) suggest that "the foundations of an individual's ideas about teaching are well established through the experience of being a student" (p. 210).

More science teachers than teachers of the other four subjects were apt to view 'facilitating students to become active and independent learners' as good teaching. This indicates that they may consciously attempt to motivate their students by emphasising the students' interests. As Kember and Kwan (2000) describe that "developing or encouraging student motivation is an intrinsic part of the teaching role"

(p. 476), this may suggest that science teachers in this study were inclined to have intrinsic motivation toward teaching.

8.1.5 Differences in conceptions of good learning across different academic subjects

The findings illustrate that there were differences in conceptions of good learning between the teachers across the five subjects. Wide variations in conceptions of 'the development of students' ability' and 'active/independent learning' between subject specialists are discussed as follows.

A great number of maths and science teachers tended to see good learning as 'the development of students' ability'. This conception is similar to Dweck's incremental theory, which states that people believe that intelligence is a malleable quality which can be changed and developed, i.e., that individuals may become more intelligent through their own efforts (Dweck et al., 1995).

The results that a great number of maths and science teachers tended to see good learning as 'the development of students' ability' is similar to the findings of previous studies on university teachers in hard disciplines in the Western context. In Dall'Alba's (1991) study, science teachers viewed teaching as developing students' capability to do experiments as a scientist would. Neumann and Becher (2002) reported that students in hard pure disciplines were expected to possess powers of logical reasoning, an ability to understand and interpret theory, and competence in problem-solving. Lattuca and Stark (1994) revealed that the sciences in general sought to enhance students' intellectual growth by developing their capacity. This could be explained by maths and science teachers' belief in the role of ability in learning maths and science and by the broader culture emphasising ability as a key to success in learning maths and science (Stodolsky & Grossman, 1995).

The finding that maths and science teachers were inclined to view good learning as the development of students' ability is consistent with previous studies undertaken in the Chinese context. A number of studies have shown that Chinese people have a tendency to emphasise effort and a relative disregard for innate ability (e.g., Chan & Elliott, 2004; Stevenson & Stigler, 1992). However, the results are inconsistent with previous research in the Western context. For example, Stevenson

and Stigler (1992) reported that American people strongly emphasised innate ability as a component of success in learning.

Maths and science teachers' inclination to speak of good learning as 'the development of students' ability could be explained by the broad culture in hard disciplines at tertiary level. High school teachers have received both education in their subject and pedagogical preparation from faculties in higher education (Stodolsky & Grossman, 1995). Over the past decades, the vast majority of maths and science professors and lecturers at tertiary level in Taiwan have gone to the U.S. for further studies. It follows, then, that practising maths and science teachers' conceptions about teaching and learning might have been greatly affected by the broad culture in hard disciplines at university, which stresses ability as a key to success in learning (Stodolsky & Grossman, 1995).

In contrast, the findings that more Chinese, English, and social studies teachers than maths and science teachers in this study tended to regard good learning as 'active and independent learning' are consistent with previous studies (e.g., Lattuca & Stark, 1995; Braxton, 1995; Hativa, 1997), which have shown the high value placed on general knowledge, critical thinking, and creativity in soft disciplines. The results are also in line with Neumann and Becher's (2002) claim that students in soft fields were expected to develop creativity in thinking and fluency of expression and to possess powers of analysis and synthesis. Briefly, the emphasis in soft areas on "the achievement of personal growth and the formation of an individual interpretation of the world of human experiences" (Neumann & Becher, 2002, p. 410) may foster students to learn actively and independently. This may give a possible reason why teachers of Chinese, English, and social studies were apt to view good learning as 'active and independent learning'.

In short, the results that maths and science teachers tended to view good learning as 'the development of students' ability' and that Chinese, English, and social studies teachers tended to view good learning as 'facilitating students to learn actively and independently' could be explainable in terms of the differences between disciplines in cognitive goals (Neumann & Becher, 2002) and disciplinary culture.

8.1.6 Conceptions of the student's role

The finding that the most frequently identified category of the student's role was 'dutiful/responsible learner' is similar to Pratt's (1992a) study on Chinese adults. This may be explicable in terms of Chinese traditional culture, in which duty is seen as more prominent to the future of society than individual rights (Pratt, 1992a, p. 303): in Chinese tradition there is no concept of natural or God-given rights; instead, individual rights stem from society and are subordinate to duty, moral conduct, public benefit, and social responsibility. The Chinese make sense of themselves in the light of their society and the role(s) they are given in the society. Accordingly, learning is seen as an attempt to do one's duty and responsibility to others. Three quotes illustrate this:

> The role of the student is a person's responsibility. He has to do his duty and take responsibility for others. (T-4 – 47-yr-old: Chinese)
>
> The role of the student is that he has to take care of himself and do his duty. He has to study well and then can teach his classmates and even help others. (T-8 – 51-yr-old: Chinese)
>
> The basic duty of students is to enter a university, which is their responsibility to their parents. (T-21 – 40-yr-old: Chinese)

Here it is clear that it is of prime importance for students to do their duty, not only for their own sake but for their parents and the society as well.

8.1.7 Differences in conceptions of the student's role across different academic subjects

The results indicate that teachers across the five subjects had varying perceptions of the student's role. The wide differences in conceptions of 'dutiful/responsible learner' are described below.

The finding that more maths and science teachers were apt to view the student's role as a 'dutiful/responsible learner' suggests that these teachers might think it is students themselves, not teachers, who have to take responsibility for learning in class and after class. Namely, maths and science teachers may give responsibility to the student and may channel his/her energy and interest into study. It follows that if students have poor academic performance, teachers of maths and science might not feel guilty about that. This thus suggests that maths and science teachers are apt to have lower introjected regulation toward teaching.

8.2 Conceptions of teaching methods of instruction

In the current study, the overwhelming majority of Taiwanese teachers made reference to instruction as lecturing, indicating that these teachers tended to adopt a teacher-focused approach to teaching. They gave several reasons for this. Some teachers thought that lecturing was the most effective way of teaching due to large class size, curricular reforms, and time limits. Some employed lecturing because of the characteristics of the subjects they taught. Still others considered lecturing to be their strength. These various reasons may give a possible explanation for the mixed results of previous studies, i.e., the consistency and inconsistency between teachers' conceptions of teaching and teaching strategies (Murray & Macdonald, 1997; Donche & Van Petegem, 2011).

8.2.1 Differences in conceptions of teaching methods of instruction across subjects

The results show that there was variation in teaching methods of instruction across disciplines. Over half of teachers said that they employed only lecturing as their most commonly used teaching method of instruction. More teachers of Chinese, social studies, and English in soft disciplines than those of maths and science in soft disciplines tended to combine 'inquiry' and 'activities' with 'lecturing' as their most commonly used teaching methods of instruction. The results are consistent with previous research, including Donald's (1995) study where in the humanities, the methods most commonly referred to were hermeneutics and critical thinking. Lindblom-Ylänne et al. (2006) and Lueddeke (2003) also found that teachers from soft sciences (e.g., history/social sciences and humanities) took a more student-focused approach to teaching. The results also correspond to Trigwell's (2002) study, in which design teachers were significantly more student-centred than physical science teachers in their teaching approaches, and to Neumann and Becher's (2002) study. Neumann and Becher claimed that in the 'soft' disciplines there were more face-to-face class meetings and tutorials, including discussions and debate.

Again, soft subject teachers' tendency to adopt a more student-focused approach to teaching may be explicable in terms of knowledge or course structures of different disciplines. Content in soft fields tends to be more free-ranging and qualitative and course structures more flexible, compared with the tightly structured courses of hard fields (Neumann & Becher, 2002). Lenze (1995) found that high

school English and social studies teachers incorporated more instructional approaches that allowed for student interaction because they experienced autonomy in planning curricula. This may also explain why Chinese, English, and social studies teachers in this study were inclined to see teaching as a formative process of knowledge-building by means of questioning or activities to help the student to construct and interpret textual meaning.

In brief, teachers across subjects expressed the view that different teaching methods of instruction may be due to the nature of the knowledge and the different course objectives in each discipline (Cashin & Downey, 1995).

8.3 Conceptions of individual differences in learning

The result shows that 'ability' was the most widely identified conception of individual differences in learning. This indicates that 'ability' is of prime importance to learning in these teachers' understanding of learning. The result of this study is consistent with the fact that it has been very important to distinguish the very able learners from the ordinary ones in Western learning tradition (Li, 2012). It may be because ability is found to be an important predictor of knowledge acquisition (Beier & Ackerman, 2005).

A feasible explanation for this could be that knowledge of each subject in senior high school is more academic and thus it requires senior high school students to possess better reasoning abilities (cognitive ability) than those in junior high school or in elementary school. This explanation is supported by Lohman and Lakin's (2009) claim that "all instruction is incomplete in some respects" and students need to continually "go beyond the information given to find similarities and differences between new patterns and concepts already in memory" (p. 34). That is to say, reasoning abilities are a good predictor of success in academic learning.

8.3.1 Differences in conceptions of individual differences in learning across subjects

The results show that there was variation in conceptions of individual differences in learning. Given that there are many small differences, the following sections deal with the major differences.

Of the six conceptions of differences in learning, two conceptions – 'ability' and 'motivation/ attitude' – were the most frequently identified by teachers across the five subjects. The other three conceptions – 'personality', 'gender', and 'group' – were referred to by only Chinese, English, and social studies teachers, except for one science teacher. This suggests that teachers of Chinese, English, and social studies may be more discerning about students' learning differently than teachers of maths and science.

Such differences may be explained by the concept of 'awareness' proposed by Marton and Booth (1997): "Awareness of an aspect is indicated by the perception of the potential for variation in that aspect; lack of awareness is indicated by an implicit, taken-for-granted assumption of uniformity in that aspect of the phenomenon" (cited in Akerlind, 2008, p. 635). Namely, the results suggest that teachers of maths and science may not think personality, gender, and group would affect individual students' learning as teachers of Chinese, English, and social studies did. In Akerlind's (2008) phrase, these different ways of experiencing are generally ordered "in terms of inclusivity of awareness, where more inclusive ways also represent more complex ways of experiencing the phenomenon" (p. 636). This indicates that teachers of Chinese, English, and social studies might experience students' learning differently in more complicated ways.

Again, such different awareness of individual differences in learning may be derived from disciplinary epistemological characteristics. The quantitative nature of knowledge and assessment forms like objective tests (Braxton & Nordvall, 1988), and teaching practices which focus on learning of facts, principles, and concepts (Lattuca & Stark, 1995) in hard areas may direct maths and science teachers to emphasise students' knowledge acquisition, which is closely related to students' ability and attitude.

In contrast, the fact that the qualitative nature of knowledge and assessment forms such as essays (Braxton & Nordvall, 1988), and teaching practices which focus on students' growth and character development in the soft fields may make teachers of Chinese, English, and social studies more aware of students' knowledge integration (students' different levels of sophistication and different degrees of understanding of

complex qualitative tasks), which is related to students' personality, gender, and classes as well as ability and attitude.

More maths and science teachers than teachers of the other two subjects reported that students learned differently according to ability, indicating that these teachers might think ability was closely associated with students' learning. This may be explainable in terms of teachers' epistemological beliefs. Maths and science teachers, who may hold naive epistemologies, may generally believe that knowledge is simple, clear, certain, and unchanging, that concepts are learned either quickly or not at all, and that learning ability is innate and fixed (Schommer, 1994). This is supported by Stodolsky and Grossman's (1995) study, which found maths teachers were apt to see their subject as less dynamic and more 'cut-and-dry'.

The finding that more English teachers than teachers of the other two subjects spoke of students' learning differently in ability may also be accounted for by disciplinary characteristics. Compared with the other four subjects, it is much easier for English teachers to recognise students' poor English proficiency, for example, if students cannot correctly pronounce words, write a sentence, or read articles in class. Besides, it is obvious that students' English proficiency affects their attitude toward learning, motivation, and engagement in class and learning outcomes. Below is an example.

> Students' English proficiency will affect their ability to learn English at the present stage… (T-5 – 48-yr-old: English)

This could explain why more English teachers were more aware of students' learning differently in ability.

Briefly, teachers in soft disciplines, who tended to underscore the development of critical thinking skills, to value the development and growth of students' character, and to use student-centred teaching practices, may provide a feasible explanation for Chinese, English, and social studies teachers who were more aware of individual differences in learning than teachers of maths and science.

8.4 Overall discussion of quantitative and qualitative findings

The qualitative discussion described above focused on one major finding of this study, i.e., differences in conceptions of teaching and learning between teachers

across subjects: Chinese, English, social studies, maths, and science. In interview, teachers across subjects reported qualitatively different ways of understanding the nature of teaching and learning. Analyses of interview data from thirty teachers across five subjects identified possible explanations for teachers of certain subjects who tended to have a certain type of motivation found in the quantitative part of the study. The following discussion describes how conceptions of teaching shape teachers' tendency for certain type of motivation.

Similar viewpoints on good teaching and the role of the teacher from the interviewees in certain subjects gave a possible explanation for significant differences in introjected regulation toward teaching across subjects in the quantitative section. The finding that more teachers of Chinese, social studies, and English made reference to good teaching as 'developing students' character' and the teacher's role as 'role model' is likely to imply that Chinese, social studies, and English teachers might feel guilty if they fail to set a personal example for students to follow. This suggests that teachers of Chinese, social studies, and English may have a tendency to have a higher level of introjected regulation toward teaching. The qualitative findings may account for why Chinese teachers had the highest level of introjected regulation toward teaching, followed by social studies teachers and English teachers in the quantitative section. In addition, the viewpoints on good teaching and the role of the teacher from the interview may reflect the phenomenon - in general, participants had a moderately high level of introjected regulation toward teaching in the quantitative part of the study.

In contrast, the findings that none of the maths and science teachers spoke of good teaching as 'developing students' character' and that none of the maths teachers referred to the teacher's role as 'role model' may imply that teachers of maths and science might not view the exemplary effects of teachers to the same extent as teachers of Chinese, social studies, and English. Namely, maths and science teachers may be less influenced by Confucian culture and thus they may be less vulnerable to cultural conceptions of shame and face as well as cultural expectation. On the other hand, when teaching, maths and science teachers appeared to focus more on transmitting subject matter than on being a role model, which may lead them to feel less guilty if they do not set a good example. This suggests that maths and science teachers might be likely to have a lower level of introjected regulation toward

teaching. These findings could offer a possible reason why maths teachers presented the lowest level of introjected regulation toward teaching, followed by science teachers in the quantitative section.

Varying perspectives on good teaching from the interview data may further offer a tentative explanation for the findings in the quantitative section: 1) science teachers had the highest level of intrinsic motivation toward teaching and 2) English teachers had the highest level of external regulation toward evaluation of students and the second highest level of external regulation toward teaching. The findings of the interview data that more teachers of science than those of the other four subjects spoke of good teaching as 'facilitating students to become active and independent learners' rather than as encouraging 'good academic performance' reflect that science teachers may be apt to have intrinsic motivation toward teaching because they may attempt to motivate students to learn by emphasising their interests, i.e., encouraging students to enjoy what they are doing and to try to explore and master optimal challenges. This may give possible reasons for the findings in the quantitative section that science teachers had the highest level of intrinsic motivation toward teaching.

By contrast, the finding of the interview data that more English teachers than teachers of the other four subjects made reference to good teaching as 'good academic performance' suggests that English teachers may be inclined to have external regulation toward teaching because they may try to encourage students to learn by emphasising the importance of examination marks. This may account for the results in the quantitative part of the study, which showed English teachers to have the highest level of external regulation toward evaluation of students and the second highest level of external regulation toward teaching.

It appears that conceptions of teaching and learning may be related in some fashion to certain types of motivation, as proposed by SDT. From the interview data, it is also obvious that certain categories of conceptions of teaching and learning reflect more Chinese orientations. According to Pratt (1992a),

> Conceptions of teaching represent normative beliefs about what ought to be…. Each is impregnated with values and assumptions which inform actions and guide judgments and decisions regarding political ideologies, social norms, and/or cultural ways of knowing... In this sense, we are talking about culture as knowledge, mutually constructed by individuals and the social networks of

> which they are a part. Such cultural contexts serve as tacit paradigms for how people think about teaching. (p. 217)

Therefore, the writer has tried to look into whether teachers of certain subjects may report more Eastern or more Western orientation toward teaching. The findings that more teachers of Chinese, social studies, and English referred to teaching as 'mutual learning', the teacher's role as 'role model' and good teaching as 'developing students' character' suggest that teachers of Chinese, social studies, and English tend to have more Chinese orientations toward teaching. As discussed in early sections, the concepts of 'mutual learning', 'role model', and 'developing students' character' are highly valued by Confucian culture and society. This could mean that Chinese, social studies, and English teachers in the present study had a tendency to have a higher level of introjected regulation toward teaching.

In contrast to this, the findings that more maths and science teachers spoke of teaching as 'transmitting knowledge', the teacher's role as 'knowledge transmitter', and good learning as 'the development of students' ability' illustrate that teachers of maths and science are inclined to have more Western orientations toward teaching. Compared with Confucian education, which emphasises social and moral self-cultivation, Western intellectual tradition strongly emphasises knowing and utilising knowledge to serve human needs; that is, people are conceived of as the knowers who try to know the external, material world (Li, 2012). According to Plato, the educational goal is mainly to search for truth through knowledge (Shim, 2008) and the first and foremost characteristic of a learner is to have a good mind and use it well (Li, 2012). Thus, the concept of ability is highly valued in American and other Western countries (Elliott & Phuong-Mai, 2008). There is no denying the fact that maths and science are essentially products of Western knowledge (Li, 2012). Such learning tradition has a potentially powerful role to play in the development of maths and science teachers' conceptions of learning and teaching. It is thus not surprising that maths and science teachers seem to be more influenced by the West than by the East. This could give a possible explanation for the fact that maths and science teachers in this study were apt to have a lower level of introjected regulation toward teaching.

It is noteworthy that the majority of teachers of Chinese, social studies, and English referred to good learning as 'active and independent learning'. This suggests

that teachers in the soft areas appeared to be influenced by the West in terms of conceptions of good learning. This finding seems to contradict with their tendency to have more Eastern orientations toward teaching. One possible explanation could be that Chinese, social studies, and English teachers learned Western educational theories such as scaffolding theory and the concept of autonomy when they received teacher education. Another may be that over the past ten years, one of the objectives of curriculum reforms is to develop students' ability to learn autonomously. These two likely factors may attribute to soft subject teachers' contradiction between their tendency to have more Eastern orientations toward teaching and their tendency to have more Western orientations toward learning.

To sum up, the richness of the interview data collected in this study adds to our understanding of the complex psychological constructs which are embedded in the complex relationships between Chinese historical and cultural background, Taiwanese social and working contexts, subject taught, and motivational beliefs, as suggested by Pajares (2007), who calls for culturally attentive research in educational psychology that examines human functioning in social and cultural contexts. That is, the findings of the interview data in the present study help to shed light on the findings in the quantitative part of the study. Thus, teachers' conceptions of teaching and learning, which are influenced by their culture, society, and subject, are likely to be associated in some way with the types of motivation (intrinsic motivation, identified regulation, introjected regulation, external motivation, and amotivation) proposed by SDT.

Chapter 9
Conclusion

9.1 Introduction

The variations in teaching practices among teachers across disciplines have always attracted my attention since I taught in the senior high school. In Chapter one I indicated that I considered that the work motivation of teachers might be of significant importance for their quality of instruction, student motivation and learning outcomes, advance of educational reforms, teachers' psychological health, and the satisfaction and fulfilment of teachers themselves. The research thus attempts to examine differences in teacher motivation toward various teaching tasks across five subjects.

To examine these differences, a mixed methods research design was used involving in-service senior high school teachers. Structured questionnaires were administered to 283 teachers at various locations in northern Taiwan. In addition, thirty teachers were involved in qualitative data collection using semi-structured interviews. The quantitative data demonstrated the levels and types of teacher motivation toward teaching tasks across five subjects and the qualitative data captured differences in participants' views and experiences of teaching and learning across five academic subject areas.

While recognising the limits to which one can generalise from this study, it is considered significant for me to draw tentative conclusions addressing a wider population on the basis of the following questions central to the present study:

1) What are the levels and types of motivation of Taiwanese senior high school teachers toward five teaching tasks across five subjects?
2) Are there differences between subject specialists in regard to teacher motivation toward teaching tasks?
3) Does teacher motivation differ according to particular professional tasks?

I will then reflect on the study and consider the implications, limitations, and recommendations for further work in this field.

Finally, I will outline some of my personal gains in knowledge and attitudes, which I consider have resulted from this undertaking.

9.2 Conclusion and implications

The following conclusions are based on findings from the present study and the implications of these for theory, practice, and policy in this field.

Question 1

- What are the levels and types of motivation of Taiwanese senior high school teachers toward five teaching tasks across five subjects?

It was found that, of the five types of motivation (intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation), teachers had the highest level of identified regulation toward four teaching tasks: class preparation, teaching, evaluation of students, and classroom management. They also had a relatively high level of identified regulation toward administrative tasks. These findings confirm the importance of identification over intrinsic motivation, which Koestner (2002) proposes.

Koestner states that it is more important for individuals to have consciously integrated the values of domain-relevant activities into their personal goals and values than to have their interest in the domain. This is because 'identification' keeps one oriented toward the long-term goals and promotes positive emotions, whereas intrinsic motivation focuses on short-term process pursuit (Koestner, 2002, p. 114).

These findings are a great encouragement to those who would advocate educational reforms such as school principals and administrators, and to those who teach in the teaching programmes in Taiwan. It is recommended that school principals and administrators emphasise the traditional Confucian values in education, such as the importance of education to personal and societal improvement. They can also highlight the value, meaningfulness, and importance of these professional practices to students' future success or to social contributions. That is, they can promote the priority of group goals over individual goals, i.e., the significance of social

responsibility and public benefit. In doing so, teachers may perceive their engagement in various teaching tasks as meaningful to their students and the society.

It is recommended that teacher education programmes would be unwise not to recognise that the values underpinning globalisation, such as individualism and instrumentalism, can present problems for teachers in any culture (Elliot & Phuong-Mai, 2008). Instead of wholeheartedly embracing Western values of teacher education, like increasing student teachers' subject-matter knowledge, pedagogical knowledge, and knowledge of learners and their characteristics, the findings suggest that teacher education programmes in Taiwan should apply the traditional Confucian values in education.

For example, teacher education programmes, which have traditionally focused on curriculum and pedagogy, are recommended to pay special attention to preparing student teachers with "knowledge of educational ends, purposes, and values" (Shulman, 1987), i.e., education is an end in itself. As Confucius asserts, "it is the person's self, not the external world, that is the object of his or her intellectual attention, contemplation, practice, and living", so teaching courses in Taiwan should stress Confucian values in education: "learning for one's self : one's lifelong self-perfection" (Li, 2012, p. 37 – 43).

These programmes can also provide courses with particular emphasis on the exemplary effects of teachers to help pre-service teachers with the construction of teacher identity. As Chen (2009) indicates that Taiwanese teachers have had a major change from a moral to a professional role, teacher education programmes would be unwise not to emphasise the concept of 'role model' in addition to 'professional role'. This is because role modelling is one of the most powerful means of transmitting values, attitudes, and patterns of thoughts and behaviour to students (Bandura, 1986). Such courses may help student teachers to consciously integrate the value of being a role model into their personal goals and values.

The finding that teachers had a higher level of introjected regulation than external regulation toward four of the teaching tasks but administrative tasks supports the claim made by Fernet et al. (2008) that external and introjected regulation could be influenced by the social context or a person's characteristics. This finding indicates that Taiwanese teachers were more likely to do these four professional tasks because

they would feel ashamed or lose face if they did not undertake these tasks well. One possible explanation is that teacher-reverence cultural heritage in Taiwan is used by various social agents to impose high expectations on teachers. This may place Taiwanese teachers "under a great burden to conform to society moral norms" and makes them more vulnerable to feeling ashamed or to losing face if they fail (Schoenhals, 1993, p. 199).

Accordingly, school teachers are suggested to understand that they live in a society with strong emphasis on human relationships and on four moral principles articulated by Confucius: propriety (li, 禮), righteousness, (yi, 義), integrity (lian, 廉), and a sense of shame (chi, 恥) (Li, 2012). In particular, they have to comprehend Confucius' true meaning of a sense of shame: "having a sense of shame is equal to having a nagging conscience", which urges one to correct oneself. Shame thus allows one to have room for personal growth, i.e., failures and mistakes are reasons to try to perfect oneself (Li, 2012, p. 40 – 41). This way, school teachers will take failures as an opportunity to self-improve, and thereby having a positive attitude toward their job.

Question 2

- Are there differences between subject specialists in regard to teacher motivation toward teaching tasks?

The findings that there were significant differences in 1) intrinsic motivation toward classroom management, 2) identified regulation toward class preparation, and 3) introjected regulation toward class preparation and teaching across academic subject areas indicate that teachers across subjects emphasised different aspects of SDT when doing different teaching tasks. The findings suggest that teachers' motivation at work is very complex and domain-specific, i.e., teachers' levels and types of motivation depend on the teaching tasks and subjects they teach.

However, the finding that there were no significant differences in intrinsic motivation and external regulation toward teaching between subject specialists was somewhat surprising. In addition, the finding that there were significant differences in introjected regulation toward teaching across subjects was not expected. These unexpected findings in the quantitative part of this study indicated that teacher's

motivation toward teaching across subjects needed further investigation and explanation.

I then used qualitative methods to explore teachers' motivation toward teaching across subject areas. It was hoped that the findings of the combination of methods – questionnaires and interviews – would provide a clearer answer to the questions that the research was addressing.

Hence, I used interviews to capture teachers' views on teaching and learning. The interview data revealed that there were qualitatively different ways in which the respondents viewed and experienced the role of the teacher, teaching, the role of the student, and learning. This provides answers to explain the unexpected findings in the quantitative part of this study.

Findings that there were disciplinary differences in the levels and types of motivation and in the conceptions of teaching and learning have important implications for government policy makers, educational reformers, teacher education, school principals, administrators, and teachers.

Here a clear implication is that "to ignore disciplinary differentiation – a seemingly inevitable tendency in institution-wide assessment regulations – may serve seriously to undermine the main learning objectives and the intrinsic requirements for effective educational programmes in particular knowledge areas" (Neumann & Becher, 2002, p. 414). It is thus suggested that government policy makers in Taiwan need to be cautious about making standards for the evaluation of teachers. They should bear in mind that the procedures and practices of 'Teacher Evaluation for Professional Development' must be grounded in disciplinary differences because each subject has its own particular pattern in teaching.

The findings that 'mutual learning' was the second most frequently voiced conception of teaching and 'developing the student's character' was the most widely identified conception of the role of the teacher, and that more soft subject than hard subject teachers referred to the teacher's role as 'role model', illustrate that Taiwanese teachers' views of teaching and the teacher's role are likely to be rooted in Chinese culture.

Such answers recommend that government policy makers and educational reformers should reflect on commonality and differentiation of cultural and historical constructions when looking to the West as a model for educational reforms. The wholesale adoption of the globally-dominant model from the West should be called into question. For example, they should be aware that a model of 'Teacher Evaluation for Professional Development' in Taiwan based completely on a Western model may be ineffective and unsuccessful (Yeh, 2009).

The findings that more Chinese and social studies teachers referred to good teaching as 'developing students' character', that more English teachers spoke of good teaching as 'good academic performance', and that more science teachers made reference to good teaching as 'facilitating students to become active and independent learners', are indicative of teachers' divergent views about conceptions of good teaching across subjects.

These findings suggest that school principals, administrators, and teachers should be very careful of making a generalisation about teaching performance in other disciplines from the limited perspective of their own academic discipline (Braxton, 1995). It is recommended that they understand how disciplines vary in epistemological characteristics, knowledge structure and validation, educational beliefs and goals, and group characteristics of different subject specialists when evaluating teaching performance.

It is also recommended that they use their knowledge of disciplinary differences to create change (Marincovich, 1995) and to maintain harmony between teachers across subjects simultaneously. For instance, when implementing curriculum reforms such as school-based curriculum development in Taiwan, knowledge of disciplinary differences can help school principals, administrators, and teachers to concentrate on understanding disciplinary differences in knowledge structure and educational goals. Instead of debating or arguing for their own interests, subject specialists can help one another to attain the goals associated with their disciplines.

The quantitative finding that teachers of Chinese, social studies, and English had a higher level of introjedted regulation toward teaching than teachers of maths and science, and the qualitative finding that teachers of Chinese, social studies, and English tended to have a higher level of introjedted regulation toward teaching,

whereas those of maths and science tended to have a lower level of introjected regulation toward teaching, indicate that teachers of Chinese, social studies and English may be more vulnerable to Chinese cultural views of shame and other cultural expectations than those of maths and science. These findings make an empirical contribution to the knowledge base on teachers' motivation.

It is suggested that Taiwanese school principals and administrators should realise that traditional Confucian culture has, potentially, a greater influence on teachers of Chinese, social studies, and English than on those of maths and sciences. They also need to perceive subtle differences in the construction of teachers' beliefs and values between teachers across subjects. When communicating with teachers across academic subject areas, they should be very sensitive to the group characteristics of teachers across subjects. This way, they can avoid putting unnecessary pressure on teachers, especially Chinese teachers who tend to have a higher level of introjected regulation toward the five teaching tasks.

These findings also recommend that school teachers, especially Chinese teachers, should not take on too many responsibilities if they lack the necessary self-regulation skills to manage stress. As a social studies teacher stated,

> I think a high school teacher should not bear too many responsibilities. When you take too many responsibilities, you will have enormous pressure... A teacher just does what he has to do. If a teacher shoulders too many responsibilities, he will feel frustrated and lose his motivation, confidence, and enthusiasm if he cannot meet his standards. (T10 – 46-yr-old: social studies)

This quotation is supported by the claim made by Kieschke and Schaarschmidt (2008) that teachers' professional commitment is not a uniformly positive attribute unless they possess coping capacity. They suggest that some healthy emotional distance and balance in commitment to teaching may be necessary to sustain a healthy life as a teacher. School teachers are thus suggested to have an 'energy conserving' attitude, i.e., keep some healthy emotional distance from teaching. Such attitude enables teachers to have sufficient resilience to withstand excessive stress and work-related demands, which in turn is beneficial for their health (Kieschke & Schaarschmidt, 2008).

Perhaps the most surprising finding in the interview data is that the most frequently voiced conception of individual differences in learning by Taiwanese

senior high school teachers was ‘ability’. Of the teachers across the five subjects, maths teachers were the most likely to consider individual differences in learning as a matter of ‘ability’. Furthermore, none of the maths teachers spoke of good teaching as ‘developing students’ character’. These findings indicate that maths teachers might pay close attention to students’ ability to learn subject-matter knowledge and somewhat lose sight of the development and growth of students’ character. From the perspective of the aims of education and the nature of teaching, education serves more expansive ends than academic achievement. Thus, maths teachers are called to attend to student character development and growth in their teaching. This is because senior high school students are still in a crucial stage of shaping their character. This was expressed by an English teacher in interview:

> …because I know students will have no one to guide them about the moral education after they go to college. So I consider I am the last “goalkeeper” of moral education. (T2 – 43-yr-old: English)

Findings that over half of teachers spoke of only one conception of teaching, and that a great number of teachers referred to lecturing as their most commonly used teaching method of instruction imply that the vast majority of these practising Taiwanese teachers’ conceptions of teaching tended to be bound up with the idea of ‘teaching as transmitting knowledge’, and predominantly associated with the use of lecturing. Pajares (1992) claims that “understanding the belief structures of teachers and teacher candidates is essential to improving their professional preparation and teaching practices” (p. 307), and so it is of crucial importance to expand teachers’ conceptions of teaching.

It is recommended that teacher education programmes should include courses for conceptual development. For example, teacher educators and programme designers could design courses to make student teachers aware of the epistemological beliefs, values, and assumptions embedded in the culture, the society, and educational practices that they currently take for granted (Chan & Elliott, 2004). From this, they can understand how such values, beliefs, and assumptions influence and interact with their views of teaching and learning. Such self-awareness needs not to lead them to reject their existing conceptions, but expands individual awareness of conceptions which are not currently discerned (Marton & Tsui, 2004, cited in Akerlind, 2008).

In addition, teacher educators and trainers in Taiwan should be mindful of the concept "teach as you preach". Johnson and Seagull (1968) state that teachers are too often educated by means of lectures. This is quite true for teacher educators and trainers today in Taiwan. It is thus suggested that teacher educators and trainers are first made aware that their preferred teaching method tends to be the form they were taught, and then to expand their conceptions of teaching strategies. Furthermore, they should use a variety of teaching methods, techniques, and skills, which are considered desirable for application by student teachers during teaching practices (Struyven et al., 2010). In so doing, student teachers can model the way of teaching because, compared with lecturing, hands-on experience has a positive effect on students' conceptual development and their future use of these teaching practices (Struyven et al., 2010).

Question 3

- Does teacher motivation differ according to particular professional tasks?

The finding that there were significant differences in the five types of motivation toward the five professional tasks implies that there were variations and fluctuations in the teachers' motivation across the different tasks. Thus, educational reformers, school principals, and administrators may be wise to bear in mind that it is normal and natural for teachers to have different levels of motivation for and reactions to different types of professional tasks.

Perhaps it is not surprising to find that among the five teaching tasks, teaching was ranked first in intrinsic motivation, identified regulation, and introjected regulation. On the contrary, administrative tasks were ranked first in external regulation and amotivation. Hence, before implementing any educational policies that are less closely related to the core business of teaching, school principals and administrators are recommended to first analyse individual tasks to make school teachers understand the characteristics and meaningfulness of individual tasks. From this, teachers can realise that their actions benefit their students and that their contributions are valued by students' parents and the society.

Government policy makers, school principals, and administrators may also be wise to keep in mind that when teachers perceive themselves to be incompetent at achieving intended outcomes, they lack the intention to act. It is suggested that any

initiatives of educational policies or reforms should be accompanied by appropriate training programmes which can empower teachers with knowledge and skills to undertake those tasks. That is, when teachers have a sense of competence, they will have a higher level of intrinsic motivation when performing tasks.

Nevertheless, feelings of competence will not enhance intrinsic motivation unless they are located in the context of autonomy (Deci & Ryan, 2000). It is thus suggested that school principals and administrators give teachers more autonomy in their work to allow for self-determined educational goals and responsibility for work outcomes. In short, to increase teachers' intrinsic motivation and identified regulation when they are asked to perform challenging professional tasks, school principals and administrators can first make those tasks significant and meaningful, then empower teachers with the knowledge and skills to undertake those tasks, and finally provide an autonomy-supportive environment, as suggested by SDT.

In conclusion, the findings of this study contribute to the knowledge base on teacher motivation in Taiwan by providing information related to the often neglected area of teachers' motivation and teachers' conceptions of teaching and learning across academic subjects in senior high schools. Although this research was confined to northern Taiwan, the findings are relevant to and of great significance for other areas with a similar Confucian culture.

9.3 Limitations of the study

Two limitations in the present study are listed as follows.

First, this study was conducted with volunteer teachers at only 11 public senior high schools located in northern Taiwan. In addition, it covers neither private senior high schools nor junior high schools. Thus, the participants in this study are not representative of the population and therefore the generalisation of the results to other populations with different educational and cultural backgrounds is limited.

Second, a high proportion of the questionnaire respondents (54.4%) and interviewees (56.3%) in this sample are aged from forty to fifty-one. This indicates that over half of the teachers might have been affected by primary and secondary schooling, which put a high value on moral education and self-cultivation. Such

learning experience at school may have had a profound influence on their values, beliefs, and assumptions about teaching, the teacher's role, learning, and the student's role. This may affect their answers in the questionnaires and in the interviews, which may result in a high level of introjected regulation, and emphasis on the transmission of knowledge and the development of students' character. In addition, the sample in this study consisted entirely of volunteers, who might have strong opinions. Such a sample may have a sampling bias, which also limits the representativeness of the study findings for the wider population.

9.4 Recommendations for future research

Considering the limitations of this study, several suggestions for future studies are recommended.

First, this study was limited to senior high school teachers in public schools located in northern Taiwan. Because teachers' motivation and conceptions of teaching and learning are context-dependent, future studies should be conducted with teachers at other educational levels in Taiwan or East Asian countries which by and large can be said to share the Confucian culture. From this, more consistent information would be possible and a clearer picture of East Asian teachers' motivation toward teaching tasks in Confucian-heritage cultures might be achieved. The topic is also wide open for future, cross-cultural research in other educational, historical, and cultural contexts.

Second, because the interviews in this study focused on teachers across academic subjects, future research could develop an interview schedule to look for reasons behind some findings in the quantitative section. For example, the quantitative part of this study shows that teachers had a higher level of introjected regulation than external regulation toward four of the teaching tasks, i.e., classroom preparation, teaching, evaluation of students, and classroom management. However, the writer could not find any explanations for the fact that teachers presented a higher level of introjected regulation than external regulation toward teaching tasks in previous studies. Hence, a qualitative approach is recommended to be included in future research, to explore the dynamics and the long-term effects of educational, cultural, and social contexts on teachers' motivation toward teaching tasks. This way,

a better understanding of teachers' self-determined and controlled types of motivation may be obtained.

Third, in the current study, the researcher has not discussed the relationship between conceptions of teaching and teaching approach. However, a great number of previous studies have shown that there is a relationship there (Trigwell & Prosser, 1996a, 1996b). Future research on Taiwanese teachers' conceptions of teaching may include this in their studies.

9.5 What research knowledge, skills and attitudes has the researcher gained as a result of this study?

During the course of the present study, this researcher has developed a number of research skills, both with regard to practical procedures and to intellectual growth. Some of the acquired practical skills which have been developed from scratch are listed as follows: 1) the use of computer programmes (SPSS, Statistical Package for the Social Sciences) to process and analyse data, 2) the undertaking of relatively complex statistical analyses, such as analysis of variance and factor analysis, 3) the analysis of qualitative material, and 4) interviewing skills.

Unlike the more technical skills, it is very difficult to gauge the researcher's intellectual growth as a result of the research exercise. Nevertheless, the opportunity to engage and grapple with a huge quantity of literature and to combine the findings of questionnaires and those of interviews have helped the writer to develop her abilities of description, analysis, synthesis and evaluation.

Reflecting back over a period of five years, the researcher was optimistic that this research project would offer a clear answer to the question of differences in teachers' motivation toward teaching tasks across subjects. However, the findings of this research suggest that people's subjective experiences should be carefully weighed, and systematic research should be done in order to test the real phenomenon. It is hoped that the tentative conclusions of this study reflect the realities of the research process and the phenomena under investigation.

References

Adams, J. S. (1963). Towards an understanding of inequity. *The Journal of Abnormal and Social Psychology*, *67*(5), 422–436.

Aguirre, J. M., Haggerty, S. M., & Linder, C. J. (1990). Student-teachers' conceptions of science, teaching and learning: A case study in preservice science education. *International Journal of Science Education*, *12*(4), 381–390.

Ainsworth, M. D., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: Assessed in the strange situation and at home*. Hillsdale, NJ: Erlbaum.

Akerlind, G. S. (2005). Variation and commonality in phenomenographic research methods. *Higher Education Research & Development*, *24*(4), 321–334.

Akerlind, G. S. (2008). A phenomenographic approach to developing academics' understanding of the nature of teaching and learning. *Teaching in Higher Education*, *13*(6), 633–644.

Aldag, R. J., Barr, S. H., & Brief, A. P. (1981). Measurement of perceived task characteristics. *Psychological Bulletin*, *90*(3), 415–431.

Alderfer, C. P. (1972). *Existence, relatedness, and growth; human needs in organizational settings*. New York: Free Press.

Aldridge, A. E., & Levine, K. (2001). *Surveying the social world: Principles and practice in survey research*. Buckingham: Open University Press.

Allen, N. J., & Meyer, J. P. (1996). Affective, continuance, and normative commitment to the organization: An examination of construct validity. *Journal of Vocational Behavior*, *49*, 252–276.

Allinder, R. M. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education*, *17*(2), 86–95.

Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of externally imposed deadlines on subsequent intrinsic motivation. *Journal of Personality and Social Psychology*, *34*(1), 92–98.

Anderson, R. N., Greene, M. L., & Loewen, P. S. (1988). Relationships among teachers' and students' thinking skills, sense of efficacy, and student achievement. *Alberta Journal of Educational Research*.

Arthur, J., Wring, M., Coe, R., & Hedges, L. V. (2012). *Research methods and methodologies in education*. London: SAGE.

Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement*. Longman.

Assor, A., Roth, G., & Deci, E. L. (2004). The emotional costs of parents' conditional regard: A self-determination theory analysis. *Journal of Personality*, *72*(1), 47–88.

Aydın, M., Baki, A., Yıldız, C., & Köğce, D. (2010). Mathematics teacher educators' beliefs about teacher role. *Procedia-Social and Behavioral Sciences*, *2*(2), 5468–5473.

Aypay, A. (2010). Teacher education student's epistemological beliefs and their conceptions about teaching and learning. *Procedia-Social and Behavioral Sciences*, *2*(2), 2599–2604.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and weil-being in two work settings. *Journal of Applied Social Psychology*, *34*(10), 2045–2068.

Bandura, A. (1977b). *Social learning theory*. Englewood Cliffs, N.J.: Prentice-Hall.

Bandura, A. (1977a). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191–215.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*(9), 1175–1184.

Bandura, A. (1986). *Social foundations of thought and action : A social cognitive theory*. Englewood Cliffs, N.J.: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy : The exercise of control*. New York: W.H. Freeman.

Barnabé, C., & Burns, M. (1994). Teachers' job characteristics and motivation. *Educational Research*, *36*(2), 171–185.

Baumeister, R. F. (1986). *Public self and private self*. New York: Springer.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529.

Becher, T. (1994). The significance of disciplinary differences. *Studies in higher education*, *19*(2), 151–161.

Becher, T., Henkel, M., & Kogan, M. (1994). *Graduate education in Britain*. London: Jessica Kingsley London.

Beier, M. E., & Ackerman, P. L. (2005). Age, ability, and the role of prior knowledge on the acquisition of new domain knowledge: Promising results in a real-world learning environment. *Psychology and Aging*, *20*(2), 341–355.

Bell, J. (1993). *Doing your research project: A guide for first-time researchers in education, health and social science*. Buckingham: Open University Press.

Bell, J. (2005). *Doing your research project: A guide for first-time researchers in education, health and social science* (4th ed.). Maidenhead: Open University Press.

Bell, J. (2010). *Doing your research project: a guide for first-time researchers in education, health and social science* (5th ed.). Maidenhead: Open University Press.

Bendix, R. (1956). *Work and authority in industry*. New York: Wiley.

Ben-Peretz, M., Mendelson, N., & Kron, F. W. (2003). How teachers in different educational contexts view their roles. *Teaching and Teacher Education, 19*(2), 277–290.

Berg, B. L., & Lune, H. (2012). *Qualitative research methods for the social sciences* (8th ed.). Boston: Pearson.

Bernaus, M., Wilson, A., & Gardner, R. C. (2009). Teacher's motivation, classroom strategy use, student's motivation and second language achievemen. *Porta Linguarum: revista internacional de didáctica de las lenguas extranjeras*, (12), 25–36.

Bernstein, B. (1971). On the classification and framing of educational knowledge. Young, M. F. D. (Ed.), *Knowledge and control* (pp. 47–69). London: Collier Macmillan.

Biesta, G. (2012). Mixed methods. In Arthur, J., Wring, M., Coe, R., & Hedges, L. V. (Eds.), *Research methods and methodologies in education* (pp. 147–152). London: SAGE.

Biggs, J. B. (1989). Approaches to the enhancement of tertiary teaching. *Higher Education Research and Development*, *8*(1), 7–25.

Biglan, A. (1973b). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology, 57*(3), 204.

Biglan, A. (1973). The characteristics of subject matter in different academic areas. *Journal of applied psychology*, *57*(3), 195.

Bishay, A. (1996). Teacher motivation and job satisfaction: A study employing the experience sampling method. *Journal of Undergraduate Science*, *3*(1), 147–154.

Bolden, D. S., Harries, T. V., & Newton, D. P. (2010). Pre-service primary teachers' conceptions of creativity in mathematics. *Educational Studies in Mathematics*, *73*(2), 143–157.

Boulton-Lewis, G. M., Smith, D. J. H., McCrindle, A. R., Burnett, P. C., & Campbell, K. J. (2001). Secondary teachers' conceptions of teaching and learning. *Learning and instruction*, *11*(1), 35–51.

Bowden, J. (2005). Reflections on the phenomenographic research process. In *Doing developmental phenomenography*. Melbourne: RMIT University Press.

Bowlby, J. (1969). *Attachment and loss, Vol I: Attachment*. New York: Basic Books.

Braxton, J. M. (1995). Disciplines with an affinity for the improvement of undergraduate education. In Hativah, N. & Marinovich, M. (Eds.), *Disciplinary differences in teaching and learning : implications for practice* (pp. 59–64). San Francisco, Calif.: Jossey-Bass.

Braxton, J. M., & Nordvall, R. C. (1988). Quality of graduate department origin of faculty and its relationship to undergraduate course examination questions. *Research in Higher Education*, *28*(2), 145–159.

Brigham, F. J., Scruggs, T. E., & Mastropieri, M. A. (1992). Teacher enthusiasm in learning disabilities classrooms: Effects on learning and behavior. *Learning Disabilities Research & Practice*, *7*(2), 68–73.

Bryman, A. (1988). *Quantity and quality in social research* (Vol. 18). London; New York: Routledge.

Bryman, Alan. (2006a). Integrating quantitative and qualitative research: how is it done? *Qualitative Research*, *6*(1), 97–113.

Burton, K. D., Lydon, J. E., D'Alessandro, D. U., & Koestner, R. (2006). The differential effects of intrinsic and identified motivation on well-being and performance: Prospective, experimental, and implicit approaches to self-determination theory. *Journal of Personality and Social Psychology*, *91*(4), 750–762.

Butler, R. (2007). Teachers' achievement goal orientations and associations with teachers' help seeking: Examination of a novel approach to teacher motivation. *Journal of Educational Psychology*, *99*(2), 241.

Butler, R., & Shibaz, L. (2008). Achievement goals for teaching as predictors of students' perceptions of instructional practices and students' help seeking and cheating. *Learning and Instruction*, *18*(5), 453–467.

Calderhead, J. (1996). Teachers: Beliefs and knowledge. In Berliner, D. C. & Calfree, R. C. (Eds.), *Handbook of educational psychology* (pp. 709–725). New York; London: Macmillan Library Reference USA, Simon & Schuster Macmillan ; Prentice Hall International.

Carson, R. L., & Chase, M. A. (2009). An examination of physical education teacher motivation from a self-determination theoretical framework. *Physical Education and Sport Pedagogy*, *14*(4), 335–353.

Cashin, W. E., & Downey, R. G. (1995). Disciplinary differences in what is taught and in students' perceptions of what they learn and of how they are taught. *New Directions for Teaching and Learning, 1995*(64), 81–92.

Chan, K. W., & Elliott, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education, 20*(8), 817–831.

Chang, P. H. (1992). The changing nature of Taiwan's politics. Simon, D. F. (Ed.), *Taiwan: Beyond the economic miracle* (pp. 25–42). New York: ME Sharpe.

Chen, B. C. (1999). The context for the revision on the Curriculum Guideline for 1-9 Grade Basic Education and the contents of the new curriculum guideline (Jiaoyu Yiguan Kecheng Gangyao Xiudingde Biejingyu Neihan). *Education Research and Information (Jiaoyu Yanjiu Zixun), 7*(1), 1–14.

Chen, S. F. (1999). *The satisfaction and work stress of the primary school teaching in Taidong (Taidon Diqu Guoxiao Tiaoshide Gongzuo Yaliyu Gonzuo Manyiduzhi Yanjiu)* (Unpublished master's thesis). Graduate Institution of Basic Education, Taidong Teachers' College, Taiwan.

Chen, C. S. (2009). *A study on the development of teacher profession discourse in Taiwan* (Unpublished doctoral thesis). National Taiwan Normal University, Taiwan.

Chen, Y. H. (2010). Who let teachers' enthusiasm disappear? *Parenting, 16*, 25-35. Retrieved from http://www.parenting.com.tw

Cheng, M. M. H., Chan, K. W., Tang, S. Y. F., & Cheng, A. Y. N. (2009). Pre-service teacher education students' epistemological beliefs and their conceptions of teaching. *Teaching and Teacher Education, 25*(2), 319–327.

Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and US adolescents. *Journal of Cross-Cultural Psychology*, *32*(5), 618–635.

Clark, B. R. (1996b). Substantive growth and innovative organization: New categories for higher education research. *Higher Education*, *32*(4), 417–430.

Clark, M., & Peterson, P. (1986). Teachers' thought processes. Wittrock, D. F. (Ed.), *Handbook of research on teaching* (3rd ed, pp. 255–296). New York: Macmillan.

Clements, D. H., & Battista, M. T. (1990). Constructivist Learning and Teaching. *Arithmetic Teacher*, *38*(1), 34–35.

Clifford, K. E. (1992). *Thinking in outdoor inquiry: ERIC Digest*. Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools (Eric Document Reproduction Service No. ED 348 198)[Online]. Available: http://www. ed. gov/databases/ERIC_Digests/ed348198. html.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum.

Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education* (5th ed.). London: Routledge.

Cohen, L., Manion, L., Morrison, K., & Morrison, K. R. B. (2007). *Research Methods in Education*. Routledge.

Coladarci, T. (1992). Teachers' sense of efficacy and commitment to teaching. *Journal of Experimental Education*, *60*(4), 323–37.

Creswell, J. W. (2008). *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Creswell, J. W. (2012). *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (4th ed., International ed.). Boston, Mass. ; London: Pearson.

Crocco, M. S., & Costigan, A. T. (2007). The narrowing of curriculum and pedagogy in the age of accountability urban educators speak out. *Urban Education*, *42*(6), 512–535.

D' Ailly, H. (2003). Children's autonomy and perceived control in learning: A model of motivation and achievement in Taiwan. *Journal of Educational Psychology*, *95*(1), 84–96.

Dall'Alba, G. (1991). Foreshadowing conceptions of teaching. *Research and Development in Higher Education*, *13*, 293–297.

Danner, F. W., & Lonky, E. (1981). A cognitive-developmental approach to the effects of rewards on intrinsic motivation. *Child Development*, 1043–1052.

De Charms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York: Academic Press.

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology Journal of Personality and Social Psychology*, *18*(1), 105–115.

Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum Press.

Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, *74*(4), 580–590.

Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of personality*, *62*(1), 119–142.

Deci, E. L., & Ryan, R. . (2000). The ‘what’ and ‘why’ of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268.

Deci, E. L., & Ryan, R. M. (1985a). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1985b). The general causality orientations scale: Self-determination in personality. *Journal of research in personality*, *19*(2), 109–134.

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. Berkowitz, L. (Ed.), *Advances in experimental social psychology* (Vol. 13, pp. 39–80). New York: Academic Press.

Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. Kernis, M. H. (Ed.), *Efficacy, agency, and self-esteem* (pp. 31–49). New York, N.Y., [etc.]: Plenum Press.

Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life’s domains. *Canadian Psychology/Psychologie canadienne*, *49*(1), 14–23.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*(8), 930–942.

Deci, E. L., Schwartz, A. J., Sheinman, L., & Ryan, R. M. (1981). An instrument to assess adults’ orientations toward control versus autonomy with children:

Reflections on intrinsic motivation and perceived competence. *Journal of Educational Psychology, 73*(5), 642–650.

Demirbolat, A. O. (2006). Education faculty students' tendencies and beliefs about the teacher's role in education: A case study in a Turkish University. *Teaching and Teacher Education, 22*(8), 1068–1083.

Denscombe, M. (2008). Communities of practice: A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research, 2 (3), pp. 270-283.*

Dinham, S. (1992). *Human perspectives on the resignation of teachers from the New South Wales public school system: Towards a model of teacher persistence* (Unpublished dostoral thesis). University of New England, Armidale, Australia.

Dinham, S., & Scott, C. (1996a). *Teacher satisfaction, motivation and health: Phase one of the Teacher 2000 Project.* Presented at the The Annual Meeting of the American Educational Research Association, New York.

Dinham, S., & Scott, C. (1996b). *The Teacher 2000 Project: A study of teacher satisfaction, motivation and health*. University of Western Sydney, Nepean, Sydney.

Dinham, Steve, & Scott, C. (1998). A three domain model of teacher and school executive career satisfaction. *Journal of Educational Administration, 36*(4), 362–378.

Do, T. (2008). *General causality orientation and job outcomes: The roles of managerial autonomy support and self-determined work motivation* (Unpublish master thesis). National ChengKung University, Tainan. Retrieved from http://www.searchnu.com/406

Donald, J. G. (1995). Disciplinary differences in knowledge validation. *New Directions for Teaching and Learning*, *1995*(64), 6–17.

Donche, V., & Van Petegem, P. (2011). Teacher educators' conceptions of learning to teach and related teaching strategies. *Research Papers in Education*, *26*(2), 207–222.

Donnelly, J. (1999). Interpreting differences: The educational aims of teachers of science and history, and their implications. *Journal of Curriculum Studies*, *31*(1), 17–41.

Dunkin, M. J. (1990). The induction of academic staff to a university: Processes and products. *Higher Education*, *20*(1), 47–66.

Dunkin, M. J., & Precians, R. P. (1992). Award-winning university teachers' concepts of teaching. *Higher Education*, *24*(4), 483–502.

Dweck, C. S., Chiu, C., & Hong, Y. (1995). Implicit theories and their role in judgments and reactions: A word from two perspectives. *Psychological Inquiry*, *6*(4), 267–285.

Eberhard, W. (1967). *Guilt and Sin in Traditional China.* University of California Press.

Ellemers, N., De Gilder, D., & Haslam, S. A. (2004). Motivating individuals and groups at work: A social identity perspective on leadership and group performance. *Academy of Management Review*, *29*, 459–478.

Elliott, J. G., & Phuong-Mai, N. (2008). Western influences on the east, eastern influences on the west. Tan, O. S. (Ed.), *What the West can learn from the East : Asian perspectives on the psychology of learning and motivation* (pp. 31–58). Charlotte, N.C.: Information Age Pub.

Emmer, E. T., & Hickman, J. (1991). Teacher efficacy in classroom management and discipline. *Educational and Psychological Measurement*, *51*(3), 755–765.

Entwistle, N., Skinner, D., Entwistle, D., & Orr, S. (2000). Conceptions and beliefs about “good teaching": An integration of contrasting research areas. *Higher Education Research and Development*, *19*(1), 5–26.

Ernest, P. (1989). The impact of beliefs on the teaching of mathematics. *Mathematics teaching: The state of the art*, *249*, 254.

Evans, E. D., & Tribble, M. (1986). Perceived teaching problems, self-efficacy, and commitment to teaching among preservice teachers. *Journal of Educational Research*, *80*(2), 81–85.

Fang, Z. (1996). A review of research on teacher beliefs and practices. *Educational research*, *38*(1), 47–65.

Fernet, C., Guay, F., Senecal, C., & Austin, S. (2012). Predicting intraindividual changes in teacher burnout: The role of perceived school environment and motivational factors. *Teaching and Teacher Education*, *28*(4), 514–525.

Fernet, C., Senecal, C., Guay, F., & Aydın, M. (2008). The Work Tasks Motivation Scale for Teachers (WTMST). *Journal of Career Assessment*, *16*(2), 256–279.

Fisher, C. D. (1978). The effects of personal control, competence, and extrinsic reward systems on intrinsic motivation. *Organizational Behavior and Human Performance*, *21*(3), 273–288.

Fox, D. (1983). Personal theories of teaching. *Studies in higher education*, *8*(2), 151–163.

Freeman, D., & Richards, J. C. (1993). Conceptions of teaching and the education of second language teachers. *TESOL Quarterly*, *27*(2), 193–216.

Freire, P. (1970). Pedagogy of the Oppressed. *New York: Continuum*.

Freire, P. (1998). *Pedagogy of freedom: Ethics, democracy, and civic courage*. New York: Rowman & Littlefield Pub Incorporated.

Freud, S. (1962). *The ego and the id.* New York: Norton.

Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology*, *40*(2), 287–322.

Fullan, M. (1982). *The meaning of educational change*. New York: Teachers College, Columbia University.

Fwu, B. J., & Wang, H. H. (2002). The social status of teachers in Taiwan. *Comparative Education*, *38*(2), 211–224.

Gaff, J. G., & Wilson, R. C. (1971). Faculty cultures and interdisciplinary studies. *The Journal of Higher Education*, *42*(3), 186–201.

Gage, N. L. (2009). *A conception of teaching*. Springer New York.

Gagne, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organiational Behavior*, *26*(4), 331–362.

Gagné, M., Senécal, C. B., & Koestner, R. (1997). Proximal job characteristics, feelings of empowerment, and intrinsic motivation: A multidimensional model. *Journal of Applied Social Psychology*, *27*(14), 1222–1240.

Gagné, M., Forest, J., Gilbert, M. H., Aubé, C., Morin, E., & Malorni, A. (2010). The motivation at work scale: Validation evidence in two languages. *Educational and Psychological Measurement*, *70*(4), 628–646.

Gamson, Z. F. (1966). Utilitarian and normative orientations toward education. *Sociology of Education,* 46–73.

Gao, L. (1998). Cultural context of school science teaching and learning in the People's Republic of China. *Science Education*, *82*(1), 1–13.

Gao, L., & Watkins, D. A. (2002). Conceptions of teaching held by school science teachers in PR China: Identification and cross-cultural comparisons. *International Journal of Science Education*, *24*(1), 61–79.

Gao, L., & 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.

Gao, X. (2008). Teachers' professional vulnerability and cultural tradition: A Chinese paradox. *Teaching and Teacher Education*, *24*(1), 154–165.

Garbarino, J. (1975). The impact of anticipated reward upon cross-age tutoring. *Journal of Personality and Social Psychology*, *32*(3), 421–428.

Gass, S. M., & Mackey, A. (2007). *Data elicitation for second and foreign language research*. New York: Routledge.

Gay, L. R., & Airasian, P. (2003). *Educational research: Competencies for analysis and applications*. New Jersey: Merril Prentice Hall.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education*, *13*(4), 451–58.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, *76*(4), 569–582.

Gillham, B. (2000). *The research interview*. London: Continuum.

Giroux, H. A. (1992). *Border crossings: Cultural workers and the politics of education*. New York; London: Routledge.

Gow, L., & Kember, D. (1993). Conceptions of teaching and their relationship to student learning. *British journal of educational psychology*, *63*(1), 20–23.

Grant, A. . (2008). The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions. *Journal of Applied Psychology*, *93*(1), 108–124.

Grant, A. M. (2007). Relational job design and the motivation to make a prosocial difference. *The Academy of Management Review Archive*, *32*(2), 393–417.

Guerrero, M. C. M., & Villamil, O. S. (2002). Metaphorical conceptualizations of ESL teaching and learning. *Language Teaching Research*, *6*(2), 95–120.

Guilloteaux, M. J., & Dörnyei, Z. (2008). Motivating language learners: A classroom-oriented investigation of the effects of motivational strategies on student motivation. *TESOL Quarterly*, *42*(1), 55–77.

Guskey, T. R. (1984). The influence of change in instructional effectiveness upon the affective characteristics of teachers. *American Educational Research Journal*, *21*(2), 245–259.

Hackman, J. R., & Lawler, E. E. (1971). Employee reactions to job characteristics. *Journal of applied psychology*, *55*(3), 259–286.

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied psychology*, *60*(2), 159–170.

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, *16*(2), 250–279.

Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, Mass.: Addison-Wesley.

Hagger, M. S., Chatzisarantis, N. L. D., Culverhouse, T., & Biddle, S. J. H. (2003). The processes by which perceived autonomy support in physical education

promotes leisure-time physical activity intentions and behavior: A trans-contextual model. *Journal of Educational Psychology*, *95*(4), 784–795.

Hall, B., Burley, W., Villeme, M., & Brockmeier, L. (1992). An attempt to explicate teacher efficacy beliefs among first year teachers. Paper presented at Annual Meeting of the American Educational Research Association, San Francisco.

Hall, D. L., & Ames, R. T. (1987). *Thinking Through Confucius*. SUNY Press.

Hancock, G. R., & Mueller, R. O. (2001). Rethinking construct reliability within latent systems. In *Structural Equation Modeling: Present and Future : a Festschrift in Honor of Karl Jöreskog* (pp. 195–216). Lincolnwood, IL: Scientific Software International.

Harden, R. M., & Crosby, J. (2000). AMEE Guide No 20: The good teacher is more than a lecturer-the twelve roles of the teacher. *Medical Teacher*, *22*(4), 334–347.

Hardré, P. L., Chen, C. H., Huang, S. H., Chiang, C. T., Jen, F. L., & Warden, L. (2006). Factors affecting high school students' academic motivation in Taiwan. *Asia Pacific Journal of Education*, *26*(2), 189–207.

Harris, L. R. (2008). A phenomenographic investigation of teacher conceptions of student engagement in learning. *The Australian Educational Researcher*, *35*(1), 57–79.

Hart, T. C., Rennison, C. M., & Gibson, C. (2005). Revisiting Respondent 'Fatigue Bias' in the National Crime Victimization Survey. *Journal of Quantitative Criminology*, *21*(3), 345–363.

Haslam, S. A., Powell, C., & Turner, J. (2000). Social identity, self-categorization, and work motivation: Rethinking the contribution of the group to positive and sustainable organisational outcomes. *Applied Psychology*, *49*(3), 319–339.

Hasselgren, B., & Beach, D. (1997). Phenomenography—a 'good-for-nothing brother' of phenomenology? Outline of an analysis. *Higher Education Research & Development*, *16*(2), 191–202.

Hativa, N. (1995). What is taught in an undergraduate lecture? Differences between a matched pair of pure and applied disciplines. In Hativah, N. & Marinovich, M. (Eds.), *Disciplinary differences in teaching and learning : Implications for practice* (pp. 19–27). San Francisco: Jossey-Bass.

Hativa, N. (1997). Teaching in a research university: Professors' conceptions, practices, and disciplinary differences. Papper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Healey, M. (2000). Developing the scholarship of teaching in higher education: A discipline-based approach. *Higher Education Research and Development*, *19*(2), 169–189.

Heider, F. (1958). *The psychology of interpersonal relations.* New York: Wiley.

Herzberg, F. (1966). *Work and the nature of man.* Cleveland: World Pub. Co.

Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work*. New York: Wiley.

Hewson, P. W., & Hewson, M. G. A. B. (1987). Science teachers' conceptions of teaching: Implications for teacher education. *International Journal of Science Education*, *9*(4), 425–440.

Ho, D. Y. F. (1994). Face dynamics: From conceptualization to measurement. Ting-Toomey, S. (Ed.), *The challenge of facework: Cross-cultural and interpersonal issues* (pp. 269–286). New York: NY: SUNY Press.

Ho, I. T., & Hau, K.-T. (2004). Australian and Chinese teacher efficacy: Similarities and differences in personal instruction, discipline, guidance efficacy and

beliefs in external determinants. *Teaching & Teacher Education: An International Journal of Research and Studies*, *20*(3), 313–323.

Hodgins, H. S., Koestner, R., & Duncan, N. (1996). On the compatibility of autonomy and relatedness. *Personality and Social Psychology Bulletin*, *22*, 227–237.

Hoffman, J. A. (1984). Psychological separation of late adolescents from their parents. *Journal of Counseling Psychology; Journal of Counseling Psychology*, *31*(2), 170–178.

Howard, B. C., McGee, S., Schwartz, N., & Purcell, S. (2000). The experience of constructivism: Transforming teacher epistemology. *Journal of Research on Computing in Education*, *32*(4), 455–65.

Hoy, A. W. (2008). What motivates teachers? Important work on a complex question. *Learning and Instruction*, *18*(5), 492–498.

Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education.*, *21*(4), 343–356.

Huang, S. (1987). Two studies of prototype semantics: Xiao 'Filial Piety' and Mei Mianzi 'Loss of Face'. *Journal of Chinese Linguistics*, *15*, 55–89.

Hulin, C. L., & Blood, M. R. (1968). Job enlargement, individual differences, and worker responses. *Psychological Bulletin*, *69*(1), 41–55.

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*(5), 1332–1356.

Husén, T., & Postlethwaite, T. N. (1985). *The international encyclopedia of education: Research and studies*. Oxford; New York: Pergamon Press.

Jang, E. E., McDougall, D. E., Pollon, D., Herbert, M., & Russell, P. (2008). Integrative mixed methods data analytic strategies in research on school success in challenging circumstances. *Journal of Mixed Methods Research*, *2*(3), 221–247.

Jesus, S., & Lens, W. (2005). An integrated model for the study of teacher motivation. *Applied Psychology*, *54*(1), 119–134.

Johnson, J. L., & Seagull, A. A. (1968). Form and function in the affective training of teachers. *The Phi Delta Kappan*, *50*(3), 166–170.

Joussemet, M., Landry, R., & Koestner, R. (2008). A self-determination theory perspective on parenting. *Canadian Psychology/Psychologie Canadienne*, *49*(3), 194–200.

Kagan, D. M. (1992). Implication of research on teacher belief. *Educational Psychologist*, *27*(1), 65–90.

Ke, C. I. (2006). *The research of the relation among achievement motivation, internal-externalcontrol, job characteristics and job burnout - take the public senior high school teacher in Taipei county for example* (Unpublish master thesis). Ming Chuan University, Taipei, Taiwan.

Kelman, H. C. (1958). Compliance, Identification, and Internalization: Three Processes of Attitude Change. *Journal of Conflict Resolution*, *2*(1), 51–60.

Kember, D. (1997). A reconceptualisation of the research into university academics' conceptions of teaching. *Learning and Instruction*, *7*(3), 255–275.

Kember, D., & Gow, L. (1994). Orientations to teaching and their effect on the quality of student learning. *The Journal of Higher Education*, 58–74.

Kember, D., & Kwan, K. P. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional Science*, *28*(5), 469–490.

Kember, D., & Leung, D. Y. P. (2011). Disciplinary Differences in Student Ratings of Teaching Quality. *Research in Higher Education*, *52*(3), 278–299.

Kieschke, U., & Schaarschmidt, U. (2008). Professional commitment and health among teachers in Germany: A typological approach. *Learning and Instruction*, *18*(5), 429–437.

Klassen, R. M., Al-Dhafri, S., Hannok, W., & Betts, S. M. (2011). Investigating pre-service teacher motivation across cultures using the Teachers' ten statements test. *Teaching and Teacher Education*, *27*(3), 579–588.

Klassen, R. M., Tze, V. M. C., Betts, S. M., & Gordon, K. A. (2011). Teacher efficacy research 1998–2009: signs of progress or unfulfilled promise? *Educational Psychology Review*, *23*(1), 21–43.

Knowles, A. S. (1978). *International encyclopedia of higher education*. San Francisco: Jossey-Bass Publishers.

Koballa, T., Graber, W., Coleman, D. C., & Kemp, A. C. (2000). Prospective gymnasium teachers' conceptions of chemistry learning and teaching. *International Journal of Science Education*, *22*(2), 209–224.

Koestner, R. (2002). Distinguidhing three ways of being internally motivated: A closer look at introjection, identification, and intrinsic motivation. In *Handbook of self-determination research* (pp. 101–122). New York: University of Rochester Press.

Koestner, R., & Losier, G. (2003). Disinguishing among three types of highly motivated individuals. In Deci, E. L., & Ryan, R. M. (Eds.), *Handbook of self-*

determination research (pp. 101–122). NY: University of Rochester Press: Rochester.

Koestner, R., & Losier, G. F. (1996). Distinguishing reactive versus reflective autonomy. *Journal of Personality*, *64*(2), 465–494.

Koestner, R., Losier, G. F., Vallerand, R. J., & Carducci, D. (1996). Identified and introjected forms of political internalization: Extending self-determination theory. *Journal of Personality and Social Psychology*, *70*(5), 1025–1036.

Koestner, R., Ryan, R. M., Bernieri, F., & Holt, K. (1984). Setting limits on children's behavior: The differential effects of controlling vs. informational styles on intrinsic motivation and creativity. *Journal of Personality*, *52*(3), 233–248.

Koestner, R., & Zuckerman, M. (1994). Causality orientations, failure, and achievement. *Journal of Personality*, *62*(3), 321–346.

Kohut, H. (1977). *The restoration of the self*. Madison: CT: International Universities Press.

Kolb, D. (1981). Learning styles and disciplinary differences. In Chickering, A. W., & Sanford, N. (Eds.), *The modern American college*. Jossey-Bass San Francisco.

Kunter, M., Tsai, Y. M., Klusmann, U., Brunner, M., Krauss, S., & Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. *Learning and Instruction*, *18*(5), 468–482.

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. CA: Sage: Thousand Oaks.

Kyriacou, C. (1987). Teacher stress and burnout: An international review. *Educational Research*, *29*(2), 146–152.

Larsson, S. (1983). Teachers' interpretations of the concept of experience. In Boot, R. & Reynolds, M. (Eds.), *Learning and experience in formal education*. Department of Adult and Higher Education: University of Manchester.

Lattuca, L. R., & Stark, J. S. (1995). Modifying the major: Discretionary thoughts from ten disciplines. *Review of Higher Education, 18*(3), 315–44.

Lattuca, L. R., & Stark, J. S. (1994). Will disciplinary perspectives impede curricular reform? *The Journal of Higher Education, 65*(4), 401–426.

Law, W. W. (1996a). Fortress state, cultural continuities and economic change: Higher education in mainland China and Taiwan. *Comparative Education, 32*(3), 377–394.

Law, W. W. (1998). Higher education in Taiwan: the rule of law and democracy. *International Higher Education, 11,* 4-6.

Lawler, E. E. (1973). *Motivation in work organizations.* Monterey, CA: Brooks Cole.

Lens, W., & Jesus, S. N. (1999). A psychosocial interpretation of teacher stress and burnout. In Vandenber, R., & Huberman, A. M. (Eds.), *Understanding and preventing teacher burnout : A sourcebook of international research and practice* (pp. 192–201). Cambridge, UK; New York: Cambridge University Press.

Lenze, L. F. (1995). Discipline-specific pedagogical knowledge in linguistics and Spanish. In Hativah, N. & Marinovich, M. (Eds.), *Disciplinary differences in teaching and learning : implications for practice* (pp. 65–70). San Francisco, Calif.: Jossey-Bass.

Lepper, M. R., & Greene, D. (1975). Turning play into work: Effects of adult surveillance and extrinsic rewards on children's intrinsic motivation. *Journal of Personality and Social Psychology, 31*(3), 479–486.

Leung, F. K. S. (2001). In search of an East Asian identity in mathematics education. *Educational Studies in Mathematics, 47*(1), 35–51.

Lewin, K. (1938). *The conceptual representation and the measurement of psychological forces.* Durham, NC: Duke University Press.

Li, J. (2012). *Cultural foundations of learning : East and West*. New York: Cambridge University Press.

Lin, C. J. (1983). The Republic of China (Taiwan). In Thomas, R. M., & Postlethwaite, T. (Eds.), *Schooling in East Asia* (pp. 104–135). Oxford: Pergamon.

Lin, C. L. (2010). *The effect of teacher support on basic needs and learning engagement in Taiwanese high school context* (Unpublished doctoral thesis). National Chengchi University, Taipei.

Lin, C. Y. (2009). *Contextual effects of perceived teacher autonomy support and autonomy support learning climate on university students' learning motivation in physical education*. National Taiwan Sport University, Taipei.

Lin, H. L., Gorrell, J., & Taylor, J. (2002). Influence of culture and education on US and Taiwan preservice teachers' efficacy beliefs. *The Journal of Educational Research, 96*(1), 37–46.

Lin, H. L., & Gorrell, J. (2001). Exploratory analysis of pre-service teacher Efficacy in Taiwan. *Teaching and Teacher Education*, *17*(5), 623–35.

Lin, Q. J. (1980). *A survey study of the occupational prestige and professional image of teachers in Taiwan (Tai Bei Shi Fiao Shi Zhi Ye Sheng Wang Yu Zhuan Ye Xiang Zhi Diao Cha Yan Fiu).* National Taiwan Normal University, Taipei, Taiwan.

Lin, Q. J. (1992). A survey study of the occupational prestige and professional image of teachers in Taiwan - III (Wo Guo Fiao Shi Zhi Ye Sheng Wang Yu Zhuan Ye Xing Zhi Dian Cha Yan Fiu). Ministry of Education, Taipei, Taiwan.

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*(03), 285–298.

Liu, Z. (1973). *The way of being a teacher in China - The way of teachers*. Taipei: Chung Hwa Book Co. Ltd.

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs: Prentice-Hall.

Lohman, D. F., & Lakin, J. M. (2009). Reasoning and intelligence. In *Handbook of Intelligence* (2nd ed., pp. 1–47). New York: Cambridge University Press.

Lueddeke, G. R. (2003). Professionalising teaching practice in higher education: A study of disciplinary variation and'teaching-scholarship'. *Studies in Higher Education, 28*(2), 213–228.

Lynch, M. F., Plant, R. W., & Ryan, R. M. (2005). Psychological needs and threat to safety: Implications for staff and patients in a psychiatric hospital for youth. *Professional Psychology: Research and Practice*, *36*(4), 415–425.

Marincovich, M. (1995). Concluding remarks: On the meaning of disciplinary differences. In Hativah, N. & Marinovich, M. (Eds.), *Disciplinary differences in teaching and learning: implications for practice* (pp. 113–118). Jossey-Bass San Francisco.

Martin, E., & Balla, M. (1991). Conceptions of teaching and implications for learning. *Research and Development in Higher Education, 13*, 298–304.

Martin, E., & Ramsden, P. (1992). An expanding awareness: How lectures change their understanding of teaching. Paper presented at the 1992 HERDSA Conference, Gippsland.

Martinez, M. A., Sauleda, N., & Huber, G. L. (2001). Metaphors as blueprints of thinking about teaching and learning. *Teaching and Teacher education*, *17*(8), 965–977.

Marton, F. (1981). Phenomenography—describing conceptions of the world around us. *Instructional Science*, *10*(2), 177–200.

Marton, F. (1986). Phenomenography: A research approach to investigating different understandings of reality. *Journal of Thought*, *21*(2), 28–49.

Marton, F. (1994). Phenomenography. In *The international encyclopedia of education* (Vol. 2, pp. 4424–4429). Oxford, UK: Pergamon.

Marton, F. (1996). Cognosco ergo sum. Reflections on reflections. *Reflections on Phenomenography: Toward a Methodology*, 163–202.

Marton, F., & Booth, S. (1997). *Learning and awareness*. Lawrence Erlbaum.

Marton, F., & Pong, W. Y. (2005). On the unit of description in phenomenography. *Higher Education Research & Development*, *24*(4), 335–348.

Marton, F., & Tsui, A. (2004). *Classroom discourse and the space of learning*. Mahwah, N.J.: L. Erlbaum Associates.

Maslow, A. H. (1954). *Motivation and personality*. New York ; London: Harper & Row.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, *50*(4), 370–396.

McClelland, D. C. (1961). *Achieving society.*. Princeton, N.J.: Van Nostrand.

McClelland, D. C. (1971). *Assessing human motivation*. New York: General Learning Press.

McClelland, D. C. (1985). *Human motivation*. Glenview, Ill.: Scott, Foresman.

McGregor, D. (1960). *The human side of enterprise.* New York: McGraw-Hill.

McKinney, C. W., Roberson, C. W., Gilmore, A. C., Ford, M. J., & Larkins, A. G. (1984). Some effects of three levels of teacher enthusiasm on student achievement and evaluation of teacher effectiveness. *Journal of Instructional Psychology*, *11*(3), 119–124.

Mears, C. L. (2012). In-depth interview. In Arthur, J., Wring, M., Coe, R., & Hedges, L. V. (Eds.), *Research Methods and Methodologies in Education* (pp. 170–176). London: Sage.

Meyer, J. F. (1988). Moral Education in Taiwan. *Comparative Education Review*, *32*(1), 20–38.

Midgley, C., Feldlaufer, H., & Eccles, J. S. (1989). Change in teacher efficacy and student self-and task-related beliefs in mathematics during the transition to junior high school. *Journal of Educational Psychology*, *81*(2), 247.

Mok, K. (2000). Reflecting globalization effects on local policy: Higher education reform in Taiwan. *Journal of Education Policy*, *15*(6), 637–660.

Moller, A. C., Deci, E. L., & Ryan, R. M. (2006). Choice and ego-depletion: The moderating role of autonomy. *Personality and Social Psychology Bulletin*, *32*(8), 1024–1036.

Moore, W., & Esselman, M. (1992). Teacher efficacy, power, school climate and achievement: A desegregating district's experience. Paper presented at Annual Meeting of the American Educational Research Association, San Francisco.

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, *91*(6), 1321–1339.

Moses, I. (1990). Teaching, research and scholarship in different disciplines. *Higher Education*, *19*(3), 351–375.

Murray, H. A. (1938). *Explorations in Personality*. New York: Oxford University Press.

Murray, K., & Macdonald, R. (1997). The disjunction between lecturers' conceptions of teaching and their claimed educational practice. *Higher Education*, *33*(3), 331–349.

Nettle, E. B. (1998). Stability and change in the beliefs of student teachers during practice teaching. *Teaching and Teacher Education*, *14*(2), 193–204.

Neumann, R., & Becher, T. (2002). Teaching and learning in their disciplinary contexts: A conceptual analysis. *Studies in Higher Education*, *27*(4), 405–417.

Newton, D. P., & Newton, L. D. (2009). Some student teachers' conceptions of creativity in school science. *Research in Science & Technological Education*, *27*(1), 45–60.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, *91*(3), 328–346.

Niemiec, C. P., Ryan, R. M., & Brown, K. W. (2008). The role of awareness and autonomy in quieting the ego: A self-determination theory perspective. *Transcending Self-Interest: Psychological Explorations of the Quiet Ego*, 107–116.

Nunnally, J. C. (1978). *Psychometric Theory*. New York: NY: McGraw-Hill.

O'Reilly, C. A., & Chatman, J. (1986). Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization on prosocial behavior. *Journal of Applied Psychology, 71*(3), 492–499.

Olejnik, S., & Algina, J. (2000). Measures of effect size for comparative studies: Applications, interpretations, and limitations. *Contemporary Educational Psychology, 25*(3), 241–286.

Opie, C. (2004). *Doing educational research: a guide to first-time researchers*. London: SAGE.

Ou, Y. S., & Yang, H. W. (1999). The contents and characteristics of the Curriculum Guideline for 1-9 Grade Basic Education (Jiunain Yiguan KechengGangyaode Neihanyu Tese) (pp. 1–2). Paper presented at the The Curriculum Guideline for 1-9 Grade Basic Education, Taipei Municipal Teachers College: Taipei, Taiwan.

Oxford, R. L., Tomlinson, S., Barcelos, A., Harrington, C., Lavine, R. Z., Saleh, A., & Longhini, A. (1998). Clashing metaphors about classroom teachers: Toward a systematic typology for the language teaching field. *System, 26*(1), 3–50.

Oxman, W. B., & Michelli, N. M. (1980). *Teacher stress in an urban center: Analysis of a survey of moral among Newark teachers* (No. Contract No. 4000-79-0054). Montclair, NJ: MontclairState College.

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*(1), 3–72.

Pajares, M. F. (2007). Culturalizing educational psychology. In Salili, N., & Hoosain, R. (Eds.), *Culture, motivation, and learning* (pp. 19–42). Charlotte, N.C.: Information Age Pub.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, *62*(3), 307–332.

Pan, H. L. (2011). *A white paper on senior high school educational policies program*. National Taiwan Normal University.

Pan, H. L., & Yu, C. (1999). Educational reforms and their impacts on school effectiveness and improvement in Taiwan, R.O.C. *School Effectiveness and Improvement*, *10*(1), 72–85.

Parpala, A., & Lindblom-Ylanne, S. (2007). University teachers' conceptions of good teaching in the units of high-quality education. *Studies in Educational Evaluation*, *33*(3), 355–370.

Patrick, B. C., Hisley, J., & Kempler, T. (2000). 'What's everybody so excited about?': The effects of teacher enthusiasm on student intrinsic motivation and vitality. *The Journal of Experimental Education*, *68*(3), 217–236.

Patrick, K. (1992). Teachers and curriculum design at year 12: Constructing an object of study. Paper presented at the joint conference of the Australian Association for Research and the New Zealand Association for Research in Education, Geelong, Victoria: Deakin University.

Patterson, T. G., & Joseph, S. (2007). Person-centered personality theory: Support from self-determination theory and positive psychology. *Journal of Humanistic Psychology*, *47*(1), 117–139.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Briere, N. M. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion*, *25*(4), 279–306.

Pelletier, L. G., Séguin-Lévesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching behaviors. *Journal of Educational Psychology, 94*(1), 186–196.

Piaget, J. (1971). *Biology and knowledge*. Chicage: University of Chicago Press.

Pithers, R. T., & Fogarty, G. J. (1995). Occupational stress among vocational teachers. *British Journal of Educational Psychology, 65*(1), 3.

Poppleton, P. (1999). Leading from behind: a comparative view of the proposed reform of teacher training. *Journal of Education for Teaching: International Research and Pedagogy*, *25*(3), 233–245.

Poppleton, P., Gershunsky, B. S., & Pullin, R. T. (1994). Changes in administrative control and teacher satisfaction in England and the USSR. *Comparative Education Review*, *38*(3), 323–346.

Porter, L. W., & Lawler, E. E. (1968). *Managerial attitudes and performance*. Homewood, Ill.: R.D. Irwin.

Potter, J., & Hepburn, A. (2005). Qualitative interviews in psychology: problems and possibilities. *Qualitative Research in Psychology*, *2*(4), 281–307.

Pratt, D. D. (1992a). Conceptions of teaching. *Adult Education Quarterly*, *42*(4), 203–220.

Pratt, D. D. (1992b). Chinese conceptions of learning and teaching: A Westerner's attempt at understanding. *International Journal of Lifelong Education*, *11*(4), 301–319.

Pratt, D. D. (1991). Conceptions of self within China and the United States: Contrasting foundations for adult education. *International Journal of Intercultural Relations*, *15*(3), 285–310.

Prick, L. (1989). Satisfaction and stress among teachers. *International Journal of Educational Research, 13*(4), 363–377.

Prosser, M., Trigwell, K., & Taylor, P. (1994). A phenomenographic study of academics' conceptions of science learning and teaching. *Learning and Instruction*, *4*(3), 217–231.

Quinlan, K. M. (1997). Case studies of academics' educational beliefs about their discipline: Toward a discourse on scholarly dimensions of teaching. Paper presented at the Herdsa Annual International Conference, 8-11 July, 1997 (pp. 8–11).

Ramachandran, V. (2005). Why school teachers are demotivated and disheartened. *Economic and Political Weekly*, 2141–2144.

Reeve, J. (2002). Self-determination theory applied to educational settings. In *Handbook of self-determination research* (Vol. 2, pp. 183–204). Rochester, NY: University of Rochester Press.

Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal*, *106*(3), 225–236.

Reeve, J., Bolt, E., & Cai, Y. (1999). Autonomy-supportive teachers: How they teach and motivate students. *Journal of Educational Psychology, 91*(3), 537–548.

Richardson, P. W., & Watt, H. M. G. (2006). Who chooses teaching and why? Profiling characteristics and motivations across three Australian universities. *Asia-Pacific Journal of Teacher Education, 34*(1), 27–56.

Richardson, P. W., & Watt, H. M. G. (2010). Current and future directions in teacher motivation research. *The Decade Ahead: Applications and Contexts of Motivation and Achievement (Advances in Motivation and Achievement, Volume 16), Emerald Group Publishing Limited, 16*, 139–173.

Riggs, I. M., & Enochs, L. G. (1990). Toward the development of an elementary teacher's science teaching efficacy belief instrument. *Science Education*, *74*(6), 625–637.

Roberts, K. H., & Glick, W. (1981). The job characteristics approach to task design: A critical review. *Journal of Applied Psychology*, *66*(2), 193–217.

Robson, C. (2011). Real world research: A resource for users of social research methods in applied settings. Oxford: Wiley-Blackwell.

Ross, J. A. (1992). Teacher efficacy and the effects of coaching on student achievement. *Canadian Journal of Education/Revue canadienne de l'education*, 51–65.

Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology*, *99*(4), 761–774.

Ryan, R. M., Williams, G. ., Patrick, H., & Deci, E. L. (2009). Self-determination theory and physical activity: The dynamics of motivation in development and wellness. *Hellenic Journal of Psychology*, *6*(2), 107–124.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43*(3), 450–461.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, *63*(3), 397–427.

Ryan, R. M., & Brown, K. W. (2003). Why we don't need self-esteem: On fundamental needs, contingent love, and mindfulness. *Psychological Inquiry*, *14*(1), 71–76.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, *57*(5), 749–761.

Ryan, R. M., Connell, J. P., & Deci, E. L. (1985). A motivational analysis of self-determination and self-regulation in education. *Research on Motivation in Education: The Classroom Milieu*, *2*, 13–51.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68.

Ryan, R. M., & Deci, E. L. (2002). On assimilating identities to the self: a self-determination theory perspective on internalization and integrity within cultures. In Leary, M.R. & Tangney, J. P. (Eds.), *Handbook of self and identity* (pp. 255–273). New York: Guilford Press.

Ryan, R. M., & Deci, E. L. (2008). A self-determination theory approach to psychotherapy: The motivational basis for effective change. *Canadian Psychology/Psychologie Canadienne*, *49*(3), 186–193.

Ryan, R. M., Deci, E. L., Grolnick, W. S., & La Guardia, J. G. (2006). The significance of autonomy and autonomy support in psychological development and psychopathology. In Cicchetti, D. & Cohen, D. J. (Eds.), *Developmental psychopathology, Volume 1: Theory and Method* (Vols. 1-2nd ed, pp. 795–894). Hoboken, NJ: John Wiley & Sons.

Ryan, R. M., & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology*, *50*(3), 550–558.

Ryan, R. M., Kuhl, J., & Deci, E. L. (1997). Nature and autonomy: An organizational view of social and neurobiological aspects of self-regulation in behavior and development. *Development and Psychopathology, 9*(4), 701–728.

Ryan, R. M., & Lynch, J. H. (1989). Emotional autonomy versus detachment: Revisiting the vicissitudes of adolescence and young adulthood. *Child Development*, 340–356.

Saban, A., Kocbeker, B. N., & Saban, A. (2007). Prospective teachers' conceptions of teaching and learning revealed through metaphor analysis. *Learning and Instruction, 17*(2), 123–139.

Saklofske, D. H., Michayluk, J. O., & Randhawa, B. S. (1988). Teachers' efficacy and teaching behaviors. *Psychological Reports, 63*(2), 407–414.

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 224–253.

Saljo, J. (1988). Learning in educational settings: Method of inquiry. Ramsden, P. (Ed.), *Improving learning: New perspectives* (pp. 32–48). London: Kogan Page.

Säljö, R. (1979). Learning about learning. *Higher Education, 8*(4), 443–451.

Samuelowicz, K., & Bain, J. D. (1992). Conceptions of teaching held by academic teachers. *Higher Education, 24*(1), 93–111.

Samuelowicz, K., & Bain, J. D. (2001). Revisiting academics' beliefs about teaching and learning. *Higher Education, 41*(3), 299–325.

Schoenhals, M. (1993). *The paradox of power in a People's Republic of China middle school*. ME Sharpe.

Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82*(3), 498–504.

Schommer, M. (1994). Synthesizing epistemological belief research: Tentative understandings and provocative confusions. *Educational Psychology Review*, *6*(4), 293–319.

Scott, C., Cox, S., & Dinham, S. (1998). An English study of teacher satisfaction, motivation, and health. Presented at the The Annual Meeting of American Educational Research Association Conference, San Diego.

Sergiovanni, T. (1967). Factors which affect satisfaction and dissatisfaction of teachers. *Journal of Educational Administration*, *5*(1), 66–82.

Sheldon, K. M., & Krieger, L. S. (2007). Understanding the negative effects of legal education on law students: A longitudinal test of self-determination theory. *Personality and Social Psychology Bulletin*, *33*(6), 883–897.

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, *76*(3), 482–497.

Sheldon, K. M., Ryan, R. M., Deci, E. L., & Kasser, T. (2004). The independent effects of goal contents and motives on well-Being: It's both what you pursue and why you pursue it. *Personality and Social Psychology Bulletin*, *30*(4), 475–486.

Shih, S. S. (2008). The relation of self-determination and achievement goals to Taiwanese eighth graders' behavioral and emotional engagement in schoolwork. *The Elementary School Journal*, *108*(4), 313–334.

Shim, S. H. (2008). A philosophical investigation of the role of teachers: A synthesis of Plato, Confucius, Buber, and Freire. *Teaching and Teacher Education*, *24*(3), 515–535.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, *57*(1), 1–23.

Sjostrom, B., & Dahlgren, L. O. (2002). Nursing theory and concept development or analysis: Applying phenomenography in nursing research. *Journal of Advanced Nursing*, *40*(3), 339–345.

Skaalvik, E. M., & Skaalvik, S. (2009). Does school context matter? Relations with teacher burnout and job satisfaction. *Teaching and Teacher Education*, *25*(3), 518–524.

Skinner, B. F. (1953). *Science and human behavior*. Free Press.

Smart, J. C., & Ethington, C. A. (1995). Disciplinary and institutional differences in undergraduate education goals. In Hativah, N. & Marincovich, M. (Eds.), *Disciplinary differences in teaching and learning* (pp. 40–58). Jossey-Bass.

Smart, J. C., & Elton, C. R. (1982). Validation of the Biglan Model. *Research in Higher Education*, *17*(3), 213–229.

Smeby, J. C. (1996). Disciplinary differences in university teaching. *Studies in Higher Education*, *21*(1), 69–79.

Smith, W. E. (1975). *The effects of anticipated vs. unanticipated social reward on subsequent intrinsic motivation*. Cornell University.

Soenens, B., Vansteenkiste, M., Lens W, Luyckx K., Goossens L., Beyers W., & Ryan R. M. (2007). Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental Psychology*, *43*(3), 633–646.

Stajkovic, A. D., & Luthans, F. (2003). Social cognitive theory and self-efficacy: Implications for motivation theory and practice. In Porter, L. W., Bigley, G. A.,

& Steers, R. M. (Eds.), *Motivation and work behavior* (pp. 126–140). McGraw-Hill.

Steers, R. M., & Mowday, R. T. (1977). The motivational properties of tasks. *Academy of Management Review*, 645–658.

Steers, R. M., Mowday, R. T., & Shapiro, D. L. (2004). Introduction to special topic forum: The future of work motivation theory. *The Academy of Management Review*, *29*(3), 379–387.

Stevenson, H. W., & Stigler, J. W. (1992). *The learning gap : Why our schools are failing and what we can learn from Japanese and Chinese education*. New York: Summit Books.

Stodolsky, S. S., & Grossman, P. L. (1995). Subject-matter differences in secondary schools: connections to higher education. In Hativah, N. & Marinovich, M. (Eds.), *Disciplinary differences in teaching and learning: implications for practice* (pp. 71–78). San Francisco, Calif.: Jossey-Bass.

Struyven, K., Dochy, F., & Janssens, S. (2010). 'Teach as you preach': the effects of student-centred versus lecture-based teaching on student teachers' approaches to teaching. *European Journal of Teacher Education*, *33*(1), 43–64.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46). Thousand Oaks, CA: Sage.

Taylor, F. W. (1911). *The principles of scientific management*. New York: Harper.

Tien, H. M. (1992). Taiwan's evolution toward democracy: A historical perspective. Simon, D. F. (Ed.), *Taiwan: beyond the economic miracle* (pp. 3–23). New York: ME Sharpe.

Tien, H. M., & Chu, Y. H. (1994). Taiwan's domestic political reforms, institutional change and power realingnment. In *Taiwan in the Asia-Pacific in the 1990s*

(pp. 1–20). St. Leonards, NSW, Australia; Canberra, ACT, Australia: Allen & Unwin ; Dept. of International Relations, Australian National University.

Tolman, E. C. (1959). Principle of purposive behavior. Koch, S. E. (Ed.), *Psychology: A study of a science (pp. 32-56).* New York: McGraw-Hill.

Triandis, H. C., McCusker, C., & Hui, C. H. (1990). Multimethod probes of individualism and collectivism. *Journal of Personality and Social Psychology, 59*(5), 1006–1020.

Trigwell, K. (2000). A Phenomenographic interview on phenomenography. In Bowden, J. A., & Walsh, E. (Eds.), *Phenomenography* (pp. 62–82). Melbourne: RMIT University Press.

Trigwell, K. (2002). Approaches to teaching design subjects: A quantitative analysis. *Art, Design and Communication in Higher Education, 1*(2), 69–80.

Trigwell, K., & Prosser, M. (1996a). Changing approaches to teaching: A relational perspective. *Studies in Higher Education, 21*(3), 275–284.

Trigwell, K., & Prosser, M. (1996b). Congruence between intention and strategy in university science teachers' approaches to teaching. *Higher Education, 32*(1), 77–87.

Trouilloud, D., Sarrazin, P., Bressoux, P., & Bois, J. (2006). Relation between teachers' early expectations and students' later perceived competence in physical education classes: Autonomy-supportive climate as a moderator. *Journal of Educational Psychology, 98*(1), 75– 86.

Tsai, C. C. (2002). Nested epistemologies: science teachers' beliefs of teaching, learning and science. *International Journal of Science Education, 24*(8), 771–783.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, *17*(7), 783–805.

Turner, A. N., & Lawrence, P. R. (1965). *Industrial jobs and the worker*. Boston: Harvard Univ.

Tymms, P. (2012). Questionnaires. In Arthur, J., Wring, M., Coe, R., & Hedges, L. V. (Eds.), *Research methods and methodologies in education* (pp. 231–240). London: SAGE.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. Zanna, M. P. (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271–360). San Diego: Academic Press.

Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, *72*(5), 1161–1176.

Van Petegem, P., & Donche, V. (2008). Perceptions of factors influencing student-focused teaching approaches in higher education: Outcomes of an action research. *Journal of All India Association for Educational Research*, *20*, 3–4; 27–35.

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, *87*(2), 246–260.

Vreeland, R. S., & Bidwell, C. E. (1966). Classifying university departments: An approach to the analysis of their effects upon undergraduates' values and attitudes. *Sociology of Education*, 237–254.

Vroom, V. H. (1959). Some personality determinants of the effects of participation. *The Journal of Abnormal and Social Psychology*, *59*(3), 322–327.

Vroom, V. H. (1964). *Work and motivation*. New York: Wiley.

Wang, H. H. (2004). Why teach science? Graduate science students' perceived motivations for choosing teaching as a career in Taiwan. *International Journal of Science Education*, *26*(1), 113–128.

Waring, M. (2012). Grounded theory. In Arthur, J., Wring, M., Coe, R., & Hedges, L. V. (Eds.), *Research methods and methodologies in education* (pp. 297–308). London: SAGE.

Watt, H. M. G., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction*, *18*(5), 408–428.

Watters, J. J., & Ginns, I. S. (1995). *Origins of, and changes in preservice teachers' science teaching self efficacy*. Paper presented at the Annual Meeting of National Association for Researchin Science Teaching, San Francisco CA.

Weng, F. Y. (1999a). Educational reform and development in Taiwan. In Mok, K. H., & Ku, Y. W. (Eds.), *A comparative study of social development in Hong Kong, Taiwan and Mainland China* (pp. 38–56). Hong Kong: Hong Kong Humanities Press.

White, R. W. (1963). *Ego and reality in psychoanalytic theory; a proposal regarding independent ego energies.* New York: International Universities Press.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, *66*(5), 297–333.

Wigfield, A., & Eccles, J. S. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review*, *12*(3), 265–310.

Wild, T. C., Enzle, M. E., & Hawkins, W. L. (1992). Effects of perceived extrinsic versus intrinsic teacher motivation on student reactions to skill acquisition. *Personality and Social Psychology Bulletin, 18*(2), 245–251.

Wild, T. C., Enzle, M. E., Nix, G., & Deci, E. L. (1997). Perceiving others as intrinsically or extrinsically motivated: Effects on expectancy formation and task engagement. *Personality and Social Psychology Bulletin, 23,* 837–848.

Wilkinson, D., & Birmingham, P. (2003). *Using research instruments: A guide for researchers*. London: RoutledgeFalmer.

William, M., & Koestner, R. (1993). Developmental origins and sequelae of reactive and reflective autonomy. Montreal, Quebec: Paper presented in the meeting of the Canadian Psychological Association.

Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: a test of self-determination theory. *Journal of Personality and Social Psychology, 70*(4), 767–779.

Williams, G. C., & Deci, E. L. (1998). The importance of supporting autonomy in medical education. *Annals of Internal Medicine, 129*(4), 303–308.

Williams, G. C., Saizow, R., Ross, L., & Deci, E. L. (1997). Motivation underlying career choice for internal medicine and surgery. *Social Science and Medicine, 45*(11), 1705–1713.

Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology, 82*(1), 81–91.

Wu, S. (1979). *Pi-chiao che-hsueh yu wen-hua (Comaprative philosophy and culture)*. Taipei: Tung ta tu-shu yu-hsien kung-su.

Xie, B. C. (1996). The work satisfaction of teachers from all levels of schools in the Taiwan province (Taiwansheng Suoxia Geji Xuexian Fiaoshi Gongzuo

Manyidu Diaocha). Taiwan: The Department of Education, Taiwan Provincial Government.

Yang, K. (1986). Chinese Personality and its Change. In *The Psychology of the Chinese People*. Oxford University Press.

Yayli, D. (2009). New roles for literacy teachers in the age of multiliteracies: A sociocultural perspective. *Procedia - Social and Behavioral Sciences, 1*(1), 206–209.

Yeh, L. J. (2009). *The study on constructing the indicator of Professional Development Evaluation of elementary school teacher - Confucian's educational thought as the core spirit* (Unpublished doctoral thesis). National Pintung University of Education, Taiwan.

Zembylas, M., & Papanastasiou, E. (2004). Job satisfaction among school teachers in Cyprus. *Journal of Educational Administration, 42*(3), 357–374.

Zhang, D. (1988). Chinese culture and Chinese philosophy. *Contemporary Chinese Thought, 19*(3), 69–95.

Zhou, N. (1988). Historical contexts of educational reforms in present-day China. *Interchange, 19*(3), 8–18.

Zhuang, Z. X. (1998). Major survey on teachers: Teachers speak out. Paper presented at the Commonwealth 1998 Special Issue on Education: Engineers for Hope for the 21st Century (Tianxia Zhazhi: 1998 Fiaoyu Tekan: Kuashiji Xiwang Gongcheng), Taipei: Commonwealth Publishers.

Zuckerman, M., Porac, J., Lathin, D., & Deci, E. L. (1978). On the importance of self-determination for intrinsically-motivated behavior. *Personality and Social Psychology Bulletin, 4*(3), 443–446.

Zuljan, M. V. (2007). Students' conceptions of knowledge, the role of the teacher and learner as important factors in a didactic school reform. *Educational Studies, 33*(1), 29–40.

Appendices

Appendix 1 Definition of Terms

The terms used in this study are briefly defined as follows:

1. Intrinsic motivation: It involves doing a behaviour because the activity itself is interesting and satisfying (Deci, 1975; Deci & Ryan, 2008).
2. Identified regulation: People have identified with a value of a behaviour, accept the behaviour as personally important, and have a relatively internal perceived locus of causality.
3. Introjected regulation: it involves an external regulation having been internalized but not, in a much deeper sense, truly accepted as one's own. That is, people engage behaviours to feel better about self-worth or avoid self-esteem blows or self-disapproval (Deci & Ryan, 1995).
4. External regulation: People's behaviour is driven by externally controlled rewards or punishments, i.e., contingencies of reinforcement and punishment.
5. Amotivation: It involves the lack of intention to act. Amotivation results from a person perceives oneself to be incompetent to achieve intended outcomes, not valuing a behaviour or outcome, or believe that a valued outcome is not connected with specific behaviour (Deci & Ryan, 1985a; Deci & Ryan, 2008).
6. Classroom preparation: It involves deciding on instruction topics and materials, determining the presentation forms and sequences, and establishing the work procedure.
7. Teaching: It involves presenting instruction, answering questions, and listening to the students' needs.
8. Evaluation of students: It involves constructing assessments and exams, correcting, entering marks, giving remarks to the parents.
9. Classroom management: It involves handling discipline, applying the rules, and managing students' interruptions and conflicts.
10. Administrative tasks: It involves recording and transmitting absences, building disciplinary files, and participating in meetings with the parents and principals to study disciplinary cases, meetings with teachers, and meetings with the administration.

Appendix 3.1 The Sample for Questionnaires

Subject / School		Chinese		English		Social studies		Maths		Science	
		M	F	M	F	M	F	M	F	M	F
Taipei First Girls High School	First Girls H/S	0	2	0	3	4	0	3	2	0	4
Taipei Municipal Senior High School (3)	Chenggong H/S	1	4	0	3	3	2	8	2	3	4
	NeiHu H/S	1	4	0	6	2	3	2	2	2	2
	Wangfang H/S	0	5	0	5	1	4	1	4	2	3
Taipei Community Senior High School (4)	Zhong He H/S	1	3	1	3	4	1	3	2	0	5
	HsinTien H/S	0	6	1	4	1	3	1	4	1	4
	Panchiao H/S	1	4	3	2	4	1	2	3	2	3
	Xinzhuang H/S	1	9	0	13	2	0	7	2	2	2
Taoyuan Community Senior High School (3)	Daxi H/S	2	3	1	2	2	2	2	1	2	3
	Jhongli H/S	0	3	0	5	2	2	2	4	2	5
	Ping Jen H/S	0	6	1	5	3	3	3	3	1	5
In Total	283	7	49	7	51	28	21	34	29	17	40

Appendix 3.2 The 15 Items Assessing the Motivational Constructs for Each Task

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Intrinsic Motivation

Because it is pleasant to carry out this task.

Because I find this task interesting to do.

Because I like doing this task.

Identified Regulation

Because it is important for me to carry out this task.

Because this task allows me to attain work objectives that I consider important.

Because I find this task important for the academic success of my students.

Introject*ed regulation*

Because if I don't carry out this task, I will feel bad.

Because I would feel guilty not doing it.

To not feel bad if I don't do it.

External regulation

Because my work demands it.

Because the school obliges me to do it.

Because I'm paid to do it.

Amotivation

I don't know, I don't always see the relevance of carrying out this task.

I used to know why I was doing this task, but I don't see the reason anymore.

I don't know, sometimes I don't see its purpose.

(English version, Fernet et al. 2008)

Appendix 3.3 A The Work Tasks Motivation Scale for Teachers (Pilot Study)

(English version, Fernet, C., Senécal, C., Guay, F., Marsh, H., & Dowson, M., 2008)

Dear teacher,

I am very grateful to you for completing this questionnaire. The purpose of the questionnaire is aimed to understand senior high school teachers' working condition. I believe that you could provide valuable information for this study. I would, therefore, like to invite you to participate in this study by responding to this questionnaire as fully as possible. Your information will be kept strictly confidential. The results of the survey will not be analysed by individual schools but only served as research data. If you need any more explanation, you can contact the researcher on the email address and telephone number provided at the end of this letter.

Thank you for your participation.

The School of Education at Durham University in UK

Taso Tai-Ling

March, 2011

General and Demographic Information

Sex	□(1) male	□(2) female		
Subject	□(1)Chinese	□(2)English	□(3) maths	□(4) science □(5)social studies
Age	□(1)25(below)-27		□(2)28-30	□(3)31-33
	□(4)34-36		□(5)37-39	□(6)40-42
	□(7)43-45		□(8)46-48	□(9)49-51(above)
Years of	□(1)1-3	□(2)4-6	□(3)7-9	□(4)10-12
Teaching	□(5)13-15	□(6)16-18	□(7)19-21	□(8)22-24
	□(9)25 (above)			
Degree	□(1) Bachelor	□(2)Master	□(3) Philosophy of Doctor (PhD)	

Instructions

Different reasons may explain why teachers engage in their work tasks. The following statements represent some of these reasons. Using the scale below, please indicate for each statement to what degree they correspond to one of the reasons for which you are doing the following work tasks.

Instructions for Selecting Answers

1 = Never or almost never correspond
2 = Correspond a little
3 = Correspond moderately
4 = Correspond strongly
5 = Correspond completely

Part A (Classroom Preparation)

Why are you doing CLASS PREPARATION (e.g., deciding on instruction topics and material, determining the presentation forms and sequences, and establishing the work procedure)?

1.	Because it is pleasant to carry out this task.	1 2 3 4 5
2.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
3.	Because I like doing this task.	1 2 3 4 5
4.	Because my work demands it.	1 2 3 4 5
5.	Because I find this task important for the academic success of my students.	1 2 3 4 5
6.	Because the school obliges me to do it.	1 2 3 4 5
7.	I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
8.	Because it is important for me to carry out this task.	1 2 3 4 5
9.	Because I find this task interesting to do.	1 2 3 4 5
10.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
11.	Because I would feel guilty not doing it.	1 2 3 4 5
12.	Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
13.	Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5
14.	Because I'm paid to do it.	1 2 3 4 5
15.	To not feel bad if I don't do it.	1 2 3 4 5

Part B (Teaching)

Why are you doing TEACHING (e.g., presenting instruction, answering questions, and listening to the students' needs)?

16.	Because the school obliges me to do it.	1 2 3 4 5
17.	Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
18.	Because it is important for me to carry out this task.	1 2 3 4 5
19.	Because I find this task interesting to do.	1 2 3 4 5
20.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
21.	Because it is pleasant to carry out this task.	1 2 3 4 5
22.	To not feel bad if I don't do it.	1 2 3 4 5
23.	Because my work demands it.	1 2 3 4 5
24.	Because I would feel guilty not doing it.	1 2 3 4 5
25.	Because I find this task important for the academic success of my students.	1 2 3 4 5
26.	Because I like doing this task.	1 2 3 4 5
27.	I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
28.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
29.	Because I'm paid to do it.	1 2 3 4 5
30.	Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5

Part C (Evaluation of Students)

Why are you doing EVALUATION OF STUDENTS (e.g., constructing assessments and exams, correcting, entering marks, giving remarks to the parents)?

31.	Because I'm paid to do it.	1 2 3 4 5
32.	Because I find this task interesting to do.	1 2 3 4 5
33.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
34.	Because it is pleasant to carry out this task.	1 2 3 4 5
35.	Because I would feel guilty not doing it.	1 2 3 4 5

36. Because the school obliges me to do it. 1 2 3 4 5

37. Because I like doing this task. 1 2 3 4 5

38. To not feel bad if I don't do it. 1 2 3 4 5

39. I used to know why I was doing this task, but I don't see the reason anymore. 1 2 3 4 5

40. Because I find this task important for the academic success of my students. 1 2 3 4 5

41. Because if I don't carry out this task, I will feel bad. 1 2 3 4 5

42. Because this task allows me to attain work objectives that I consider important. 1 2 3 4 5

43. I don't know, I don't always see the relevance of carrying out this task. 1 2 3 4 5

44. Because my work demands it. 1 2 3 4 5

45. Because it is important for me to carry out this task. 1 2 3 4 5

Part D (Classroom Management)

Why are you doing CLASSROOM MANAGEMENT (e.g., handling discipline, applying the rules, and managing students' interruptions and conflicts)?

46. Because I would feel guilty not doing it. 1 2 3 4 5

47. Because this task allows me to attain work objectives that I consider important. 1 2 3 4 5

48. Because it is important for me to carry out this task. 1 2 3 4 5

49. Because if I don't carry out this task, I will feel bad. 1 2 3 4 5

50. I don't know, sometimes I don't see its purpose. 1 2 3 4 5

51. Because the school obliges me to do it. 1 2 3 4 5

52. Because it is pleasant to carry out this task. 1 2 3 4 5

53. To not feel bad if I don't do it. 1 2 3 4 5

54. Because I find this task interesting to do. 1 2 3 4 5

55. I used to know why I was doing this task, but I don't see the reason anymore. 1 2 3 4 5

56. Because I like doing this task. 1 2 3 4 5

57. Because I'm paid to do it. 1 2 3 4 5

58. Because I find this task important for the academic success of my students. 1 2 3 4 5

59.	Because my work demands it.	1 2 3 4 5
60.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5

Part E (Administrative Tasks)

Why are you doing ADMINISTRATIVE TASKS (e.g., recording and transmitting absences, building disciplinary files, and participating in meetings with the parents and principals to study disciplinary cases, meetings with teachers, meetings with the administration, meetings with the union, and school assemblies)?

61.	Because my work demands it.	1 2 3 4 5
62.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
63.	Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
64.	Because I like doing this task.	1 2 3 4 5
65.	Because I find this task important for the academic success of my students.	1 2 3 4 5
66.	I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
67.	Because it is important for me to carry out this task.	1 2 3 4 5
68.	Because I would feel guilty not doing it.	1 2 3 4 5
69.	Because the school obliges me to do it.	1 2 3 4 5
70.	Because I'm paid to do it.	1 2 3 4 5
71.	Because I find this task interesting to do.	1 2 3 4 5
72.	To not feel bad if I don't do it.	1 2 3 4 5
73.	Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5
74.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
75.	Because it is pleasant to carry out this task.	1 2 3 4 5

1. How long did it take you to complete this questionnaire?
   _____ minutes
2. Were the instructions clear?
   _____
3. Were any of the items or the questions unclear or ambiguous? If so, would you please say which and why?
   _____
   _____
   _____
4. Any comments?
   _____
   _____
   _____

If you are willing to participate in the follow-up interview, please leave your name and email address. Your participation is of great value to this study. Thank you very much.

Appendix 3.3 B The Work Tasks Motivation Scale for Teachers (Pilot Study)

教師教學動機調查問卷(預試問卷)

敬愛的老師：

您好！首先感謝您在百忙之中填答這份問卷。本調查問卷旨在了解高中教師從事教學工作的現況，本問卷僅供學術研究參考，採無記名方式，亦不做個別學校分析，敬請寬心作答。您的意見彌足珍貴，懇請撥冗填答。所有問卷皆予妥善保密，除非徵得您的同意，絕不對外公開，並於本人博士論文撰寫完成後銷毀。

若您對本研究有任何疑問，敬請電話連絡： 02-29912391 x 556 或 0921879236 Email:doralindatsao@yahoo.com.tw 承蒙協助， 衷心感激。 敬頌

教 安

英國德倫大學教育博士班研究生
曹黛玲 敬上
中華民國一百年一月

基本資料

性　　別：□ (1)男　□ (2)女

任教科目：□ (1)國文　□ (2)英文　□ (3)數學　□ (4)自然

服務年資：_____ 年

年　　齡：□ (1)25(含)以下-30 歲　□ (2)31-35 歲　□ (3)36-40 歲
□ (4)41-45 歲　□ (5)46-50 歲(含)以上

最高學歷：□ (1)師範院校　□ (2)一般大學
□ (3)碩士以上(含四十學分班)

作答說明:

為探討教師從事教學工作的各種可能原因, 請閱讀以下每一個有關教學工作的敘述，依直覺圈選一個您覺得最符合，或最接近您自己真實狀況的答案（切勿依您認為「我應該如何」或「別人會怎樣」來回答）。每一項敘述並沒有所謂的正確答案。

答案選項說明

5= 極不符合（表示該敘述幾乎完全不符合您的情況）
4= 不符合　（表示該敘述多半不符合您的情況）
3= 普通　　（表示該敘述差不多有一半符合您的情況）
2= 很符合　（表示該敘述多半符合您的情況）
1= 非常符合（表示該敘述幾乎完全符合您的情況）

您做課前準備（例如：擬定教學主題和教材、決定教學的形式和順序、確定工作程序)的理由是什麼？

	非常符合	很符合	普通	不符合	極不符合
1. 因為完成這項工作，是令人愉快的。……	1	2	3	4	5
2. 我不知道，我常不明白完成這項工作，與高中教學有何相關性？……	1	2	3	4	5
3. 因為對這項工作，我樂在其中。……	1	2	3	4	5
4. 因為這是工作上的要求。	1	2	3	4	5
5. 因為我覺得這項工作，對我學生的學業成就是重要的。	1	2	3	4	5
6. 因為應學校要求，必須這麼做。	1	2	3	4	5
7. 我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在？…	1	2	3	4	5
8. 因為完成這項工作，對我是重要的。	1	2	3	4	5
9. 因為我發現，做這個工作是有趣的。	1	2	3	4	5
10. 我不知道，有時候我看不出這項工作的目的為何？	1	2	3	4	5
11. 因為若不這麼做，我會覺得內疚。	1	2	3	4	5
12. 因為若不能完成這項工作，我會覺得不好。	1	2	3	4	5
13. 因為這項工作，讓我達成我認為是重要的工作目標。	1	2	3	4	5
14. 因為我受薪，所以我必須做。	1	2	3	4	5
15. 若不能做到這項工作，我並不覺得不好。	1	2	3	4	5

您從事教學活動（例如：傳授知識、回答問題、傾聽學生的需求）的理由是什麼？

	非常符合	很符合	普通	不符合	極不符合
16. 因為應學校要求，必須這麼做。	1	2	3	4	5
17. 因為若不能完成這項工作，我會覺得不好。	1	2	3	4	5
18. 因為完成這項工作，對我是重要的。	1	2	3	4	5
19. 因為我發現，做這個工作是有趣的。	1	2	3	4	5
20. 我不知道，有時候我看不出這項工作的目的為何？	1	2	3	4	5
21. 因為完成這項工作，是令人愉快的。	1	2	3	4	5
22. 若不能做到這項工作，我並不覺得不好。	1	2	3	4	5
23. 因為這是工作上的要求。	1	2	3	4	5
24. 因為若不這麼做，我會覺得內疚。	1	2	3	4	5
25. 因為我覺得這項工作，對我學生的學業成就是重要的。	1	2	3	4	5
26. 因為對這項工作，我樂在其中。	1	2	3	4	5
27. 我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在？	1	2	3	4	5
28. 我不知道，我常不明白完成這項工作，與高中教學有何相關性？	1	2	3	4	5
29. 因為我受薪，所以我必須做。	1	2	3	4	5
30. 因為這項工作，讓我達成我認為是重要的工作目標。	1	2	3	4	5

您做<u>學生的學習評量</u>（例如：測驗編製、改作業、評分、寫評語）的理由是什麼？

	非常符合	很符合	普通	不符合	極不符合
31. 因為我受薪，所以我必須做。	1	2	3	4	5
32. 因為我發現，做這個工作是有趣的。	1	2	3	4	5
33. 我不知道，有時候我看不出這項工作的目的為何？	1	2	3	4	5
34. 因為完成這項工作，是令人愉快的。	1	2	3	4	5
35. 因為若不這麼做，我會覺得內疚。	1	2	3	4	5
36. 因為應學校要求，必須這麼做。	1	2	3	4	5
37. 因為對這項工作，我樂在其中。	1	2	3	4	5
38. 若不能做到這項工作，我並不覺得不好。	1	2	3	4	5
39. 我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在？	1	2	3	4	5
40. 因為我覺得這項工作，對我學生的學業成就是重要的。	1	2	3	4	5
41. 因為若不能完成這項工作，我會覺得不好。	1	2	3	4	5
42. 因為這項工作，讓我達成我認為是重要的工作目標。	1	2	3	4	5
43. 我不知道，我常不明白完成這項工作，與高中教學有何相關性？	1	2	3	4	5
44. 因為這是工作上的要求。	1	2	3	4	5
45. 因為完成這項工作，對我是重要的。	1	2	3	4	5

您做<u>教室管理</u>（例如：風紀管理、執行班規、管理學生的搗亂和衝突）的理由是什麼？

	非常符合	很符合	普通	不符合	極不符合
46. 因為若不這麼做，我會覺得內疚。	1	2	3	4	5
47. 因為這項工作，讓我達成我認為是重要的工作目標。	1	2	3	4	5
48. 因為完成這項工作，對我是重要的。	1	2	3	4	5
49. 因為若不能完成這項工作，我會覺得不好。	1	2	3	4	5
50. 我不知道，有時候我看不出這項工作的目的為何？	1	2	3	4	5
51. 因為應學校要求，必須這麼做。	1	2	3	4	5
52. 因為完成這項工作，是令人愉快的。	1	2	3	4	5
53. 若不能做到這項工作，我並不覺得不好。	1	2	3	4	5
54. 因為我發現，做這個工作是有趣的。	1	2	3	4	5
55. 我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在？	1	2	3	4	5
56. 因為對這項工作，我樂在其中。	1	2	3	4	5
57. 因為我受薪，所以我必須做。	1	2	3	4	5
58. 因為我覺得這項工作，對我學生的學業成就是重要的。	1	2	3	4	5
59. 因為這是工作上的要求。	1	2	3	4	5
60. 我不知道，我常不明白完成這項工作，與高中教學有何相關性？	1	2	3	4	5

您<u>從事行政工作</u>(例如：紀錄學生的出缺席、建立違規檔案、參加行政會議如導師會報、教學研究會) 的理由是什麼？

	非常符合	很符合	普通	不符合	極不符合
61. 因為這是工作上的要求。	1	2	3	4	5
62. 我不知道，有時候我看不出這項工作的目的為何？	1	2	3	4	5
63. 因為若不能完成這項工作，我會覺得不好。	1	2	3	4	5
64. 因為對這項工作，我樂在其中。	1	2	3	4	5
65. 因為我覺得這項工作，對我學生的學業成就是重要的。	1	2	3	4	5
66. 我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在？	1	2	3	4	5
67. 因為完成這項工作，對我是重要的。	1	2	3	4	5
68. 因為若不這麼做，我會覺得內疚。	1	2	3	4	5
69. 因為應學校要求，必須這麼做。	1	2	3	4	5
70. 因為我受薪，所以我必須做。	1	2	3	4	5
71. 因為我發現，做這個工作是有趣的。	1	2	3	4	5
72. 若不能做到這項工作，我並不覺得不好。	1	2	3	4	5
73. 因為這項工作，讓我達成我認為是重要的工作目標。	1	2	3	4	5
74. 我不知道，我常不明白完成這項工作，與高中教學有何相關性？	1	2	3	4	5
75. 因為完成這項工作，是令人愉快的。	1	2	3	4	5

您花多少時間填完這份問卷? _____ 分鐘
您在回答上述問題時，是否有遇到任何困難或不了解任何項目。若有，請說明。

您如果願意接受訪談，請留下姓名、email 信箱。您的接受訪談對我的這項研究工作非常重要。感激不盡。謝謝！

_____

_____

_____

謝謝您的作答

Appendix 3.4 A The Work Tasks Motivation Scale for Teachers (Main Study)

(English version, Fernet, C., Senécal, C., Guay, F., Marsh, H., & Dowson, M., 2008)

Dear teacher,

I am very grateful to you for completing this questionnaire. The purpose of the questionnaire is aimed to understand senior high school teachers' working condition. I believe that you could provide valuable information for this study. I would, therefore, like to invite you to participate in this study by responding to this questionnaire as fully as possible. Your information will be kept strictly confidential. The results of the survey will not be analysed by individual schools but only served as research data. If you need any more explanation, you can contact the researcher on the email address and telephone number provided at the end of this letter.

Thank you for your participation.

The School of Education at Durham University in UK

Taso Tai-Ling

March, 2011

General and Demographic Information

Sex	□(1) male	□(2) female		
Subject	□(1)Chinese	□(2)English	□(3) maths	□(4) science □(5)social studies
Age	□(1)25(below)-27		□(2)28-30	□(3)31-33
	□(4)34-36		□(5)37-39	□(6)40-42
	□(7)43-45		□(8)46-48	□(9)49-51(above)
Years of	□(1)1-3	□(2)4-6	□(3)7-9	□(4)10-12
Teaching	□(5)13-15	□(6)16-18	□(7)19-21	□(8)22-24
	□(9)25 (above)			
Degree	□(1) Bachelor	□(2)Master	□(3) Philosophy of Doctor (PhD)	

Instructions

Different reasons may explain why teachers engage in their work tasks. The following statements represent some of these reasons. Using the scale below, please indicate for each statement to what degree they correspond to one of the reasons for which you are doing the following work tasks.

Instructions for Selecting Answers

1 = Never or almost never correspond
2 = Correspond a little
3 = Correspond moderately
4 = Correspond strongly
5 = Correspond completely

Part A (Classroom Preparation)

Why are you doing CLASS PREPARATION (e.g., deciding on instruction topics and material, determining the presentation forms and sequences, and establishing the work procedure)?

1. Because it is pleasant to carry out this task.	1 2 3 4 5
2. I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
3. Because I like doing this task.	1 2 3 4 5
4. Because my work demands it.	1 2 3 4 5
5. Because I find this task important for the academic success of my students.	1 2 3 4 5
6. Because the school obliges me to do it.	1 2 3 4 5
7. I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
8. Because it is important for me to carry out this task.	1 2 3 4 5
9. Because I find this task interesting to do.	1 2 3 4 5
10. I don't know, sometimes I don't see its purpose.	1 2 3 4 5
11. Because I would feel guilty not doing it.	1 2 3 4 5
12. Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
13. Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5
14. Because I'm paid to do it.	1 2 3 4 5

Part B (Teaching)

Why are you doing TEACHING (e.g., presenting instruction, answering questions, and listening to the students' needs)?

15.	Because the school obliges me to do it.	1 2 3 4 5
16.	Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
17.	Because it is important for me to carry out this task.	1 2 3 4 5
18.	Because I find this task interesting to do.	1 2 3 4 5
19.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
20.	Because it is pleasant to carry out this task.	1 2 3 4 5
21.	Because my work demands it.	1 2 3 4 5
22.	Because I would feel guilty not doing it.	1 2 3 4 5
23.	Because I find this task important for the academic success of my students.	1 2 3 4 5
24.	Because I like doing this task.	1 2 3 4 5
25.	I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
26.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
27.	Because I'm paid to do it.	1 2 3 4 5
28.	Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5

Part C (Evaluation of Students)

Why are you doing EVALUATION OF STUDENTS (e.g., constructing assessments and exams, correcting, entering marks, giving remarks to the parents)?

29.	Because I'm paid to do it.	1 2 3 4 5
30.	Because I find this task interesting to do.	1 2 3 4 5
31.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
32.	Because it is pleasant to carry out this task.	1 2 3 4 5
33.	Because I would feel guilty not doing it.	1 2 3 4 5
34.	Because the school obliges me to do it.	1 2 3 4 5

35. Because I like doing this task. 1 2 3 4 5

36. I used to know why I was doing this task, but I don't see the reason anymore. 1 2 3 4 5

37. Because I find this task important for the academic success of my students. 1 2 3 4 5

38. Because if I don't carry out this task, I will feel bad. 1 2 3 4 5

39. Because this task allows me to attain work objectives that I consider important. 1 2 3 4 5

40. I don't know, I don't always see the relevance of carrying out this task. 1 2 3 4 5

41. Because my work demands it. 1 2 3 4 5

42. Because it is important for me to carry out this task. 1 2 3 4 5

Part D (Classroom Management)

Why are you doing CLASSROOM MANAGEMENT (e.g., handling discipline, applying the rules, and managing students' interruptions and conflicts)?

43. Because I would feel guilty not doing it. 1 2 3 4 5

44. Because this task allows me to attain work objectives that I consider important. 1 2 3 4 5

45. Because it is important for me to carry out this task. 1 2 3 4 5

46. Because if I don't carry out this task, I will feel bad. 1 2 3 4 5

47. I don't know, sometimes I don't see its purpose. 1 2 3 4 5

48. Because the school obliges me to do it. 1 2 3 4 5

49. Because it is pleasant to carry out this task. 1 2 3 4 5

50. Because I find this task interesting to do. 1 2 3 4 5

51. I used to know why I was doing this task, but I don't see the reason anymore. 1 2 3 4 5

52. Because I like doing this task. 1 2 3 4 5

53. Because I'm paid to do it. 1 2 3 4 5

54. Because I find this task important for the academic success of my students. 1 2 3 4 5

55. Because my work demands it. 1 2 3 4 5

56. I don't know, I don't always see the relevance of carrying out this task. 1 2 3 4 5

Part E (Administrative Tasks)

Why are you doing ADMINISTRATIVE TASKS (e.g., recording and transmitting absences, building disciplinary files, and participating in meetings with the parents and principals to study disciplinary cases, meetings with teachers, meetings with the administration, meetings with the union, and school assemblies)?

57.	Because my work demands it.	1 2 3 4 5
58.	I don't know, sometimes I don't see its purpose.	1 2 3 4 5
59.	Because if I don't carry out this task, I will feel bad.	1 2 3 4 5
60.	Because I like doing this task.	1 2 3 4 5
61.	Because I find this task important for the academic success of my students.	1 2 3 4 5
62.	I used to know why I was doing this task, but I don't see the reason anymore.	1 2 3 4 5
63.	Because it is important for me to carry out this task.	1 2 3 4 5
64.	Because I would feel guilty not doing it.	1 2 3 4 5
65.	Because the school obliges me to do it.	1 2 3 4 5
66.	Because I'm paid to do it.	1 2 3 4 5
67.	Because I find this task interesting to do.	1 2 3 4 5
68.	Because this task allows me to attain work objectives that I consider important.	1 2 3 4 5
69.	I don't know, I don't always see the relevance of carrying out this task.	1 2 3 4 5
70.	Because it is pleasant to carry out this task.	1 2 3 4 5

1. How long did it take you to complete this questionnaire?
   _____ minutes
2. Were the instructions clear?
   _____
3. Were any of the items or the questions unclear or ambiguous? If so, would you please say which and why?
   _____
   _____
4. Any comments?
   _____
   _____
   _____

If you are willing to participate in the follow-up interview, please leave your name and email address. Your participation is of great value to this study. Thank you very much.

Appendix 3.4 B The Work Tasks Motivation Scale for Teachers (Main Study)

教師教學動機調查問卷(正試問卷)

敬愛的老師：

您好！首先感謝您在百忙之中填答這份問卷。本調查問卷旨在了解高中教師從事教學工作的現況，本問卷僅供學術研究參考，採無記名方式，亦不做個別學校分析，敬請寬心作答。您的意見彌足珍貴，懇請撥冗填答。所有問卷皆予妥善保密，除非徵得您的同意，絕不對外公開，並於本人博士論文撰寫完成後銷毀。

若您對本研究有任何疑問，敬請電話連絡： 02-29912391 ex 556 或 0921-879236 Email:doralindatsao@yahoo.com.tw 承蒙協助， 衷心感激。 敬頌

教 安

英國德倫大學教育博士班研究生

曹黛玲 敬上

中華民國一百年三月

基本資料:

性 別： □(1)男 □(2)女

任教科目： □(1)國文 □(2)英文 □(3)數學 □(4)自然 □(5)社會

年 齡： □(1)25(含)以下-27 歲 □(2)28-30 歲 □(3)31-33 歲
□(4)34-36 歲 □(5)37-39 歲 □(6)40-42 歲
□(7)43-45 歲 □(8)46-48 歲 □(9)49-51 歲(含)以上

服務年資： □(1)1-3 年 □(2)4-6 年 □(3)7-9 年 □(4)10-12 年
□(5)13-15 年 □(6)16-18 年 □(7)19-21 年 □(8)22-24 年
□(9)25 年(含)以上

最高學歷： □(1)大學 □(2)研究所(含四十學分班、碩士) □(3)博士

作答說明:

為探討教師從事教學工作的各種可能原因, 請閱讀以下每一個有關教學工作的敘述，依直覺圈選一個您覺得最符合，或最接近您自己真實狀況的答案（切勿依您認為「我應該如何」或「別人會怎樣」來回答）。每一項敘述並沒有所謂的正確答案。

答案選項說明

1= 極不符合（表示該敘述幾乎完全不符合您的情況）

2= 不符合 （表示該敘述多半不符合您的情況）

3= 普通 （表示該敘述差不多有一半符合您的情況）

4= 很符合 （表示該敘述多半符合您的情況）

5= 非常符合（表示該敘述幾乎完全符合您的情況）

您做課前準備（例如：擬定教學主題和教材、決定教學的形式和順序、確定工作程序)的理由是什麼？

	極不符合	不符合	普通	很符合	非常符合
1.因為完成這項工作，是令人愉快的。……	1	2	3	4	5
2.我不明白完成這項工作與高中教學有何相關性。……	1	2	3	4	5
3.因為對這項工作，我樂在其中。……	1	2	3	4	5
4.因為這是工作上的要求。……	1	2	3	4	5
5.因為我覺得這項工作對學生的學業成就是重要的。……	1	2	3	4	5
6.因為應學校要求，必須這麼做。……	1	2	3	4	5
7.我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在。…	1	2	3	4	5
8.因為完成這項工作，對我是重要的。……	1	2	3	4	5
9.因為我發現做這個工作是有趣的。……	1	2	3	4	5
10.我看不出這項工作的目的為何。……	1	2	3	4	5
11.因為若不這麼做，我會覺得內疚。……	1	2	3	4	5
12.因為若不能完成這項工作，我會覺得心裡難受。……	1	2	3	4	5
13.因為這項工作讓我達成我認為重要的工作目標。……	1	2	3	4	5
14.因為我受薪，所以我必須做。……	1	2	3	4	5

您從事教學活動（例如：傳授知識、回答問題、傾聽學生的需求）的理由是什麼？

	極不符合	不符合	普通	很符合	非常符合
15.因為應學校要求，必須這麼做。……	1	2	3	4	5
16.因為若不能完成這項工作，我會覺得心裡難受。……	1	2	3	4	5
17.因為完成這項工作，對我是重要的。……	1	2	3	4	5
18.因為我發現做這個工作是有趣的。……	1	2	3	4	5
19.我看不出這項工作的目的為何。……	1	2	3	4	5
20.因為完成這項工作，是令人愉快的。……	1	2	3	4	5
21.因為這是工作上的要求。……	1	2	3	4	5
22.因為若不這麼做，我會覺得內疚。……	1	2	3	4	5
23.因為我覺得這項工作對學生的學業成就是重要的。……	1	2	3	4	5
24.因為對這項工作，我樂在其中。……	1	2	3	4	5
25.我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在。…	1	2	3	4	5
26.我不明白完成這項工作與高中教學有何相關性。……	1	2	3	4	5
27.因為我受薪，所以我必須做。……	1	2	3	4	5
28.因為這項工作讓我達成我認為重要的工作目標。……	1	2	3	4	5

您做學生的學習評量（例如：測驗編製、改作業、評分、寫評語）的理由是什麼？

	極不符合	不符合	普通	很符合	非常符合
29.因為我受薪，所以我必須做。……	1	2	3	4	5
30.因為我發現做這個工作是有趣的。……	1	2	3	4	5
31.我看不出這項工作的目的為何。……	1	2	3	4	5
32.因為完成這項工作，是令人愉快的。……	1	2	3	4	5
33.因為若不這麼做，我會覺得內疚。……	1	2	3	4	5
34.因為應學校要求，必須這麼做。……	1	2	3	4	5
35.因為對這項工作，我樂在其中。……	1	2	3	4	5
36.我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在。…	1	2	3	4	5
37.因為我覺得這項工作對學生的學業成就是重要的。……	1	2	3	4	5
38.因為若不能完成這項工作，我會覺得心裡難受。……	1	2	3	4	5
39.因為這項工作讓我達成我認為重要的工作目標。……	1	2	3	4	5
40.我不明白完成這項工作與高中教學有何相關性。……	1	2	3	4	5
41.因為這是工作上的要求。……	1	2	3	4	5
42.因為完成這項工作，對我是重要的。……	1	2	3	4	5

您做教室管理（例如：風紀管理、執行班規、管理學生的搗亂和衝突）的理由是什麼？

	極不符合	不符合	普通	很符合	非常符合
43.因為若不這麼做，我會覺得內疚。……	1	2	3	4	5
44.因為這項工作讓我達成我認為重要的工作目標。……	1	2	3	4	5
45.因為完成這項工作，對我是重要的。……	1	2	3	4	5
46.因為若不能完成這項工作，我會覺得心裡難受。……	1	2	3	4	5
47.我看不出這項工作的目的為何。……	1	2	3	4	5
48.因為應學校要求，必須這麼做。……	1	2	3	4	5
49.因為完成這項工作，是令人愉快的。……	1	2	3	4	5
50.因為我發現做這個工作是有趣的。……	1	2	3	4	5
51.我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在。…	1	2	3	4	5
52.因為對這項工作，我樂在其中。……	1	2	3	4	5
53.因為我受薪，所以我必須做。……	1	2	3	4	5
54.因為我覺得這項工作對學生的學業成就是重要的。……	1	2	3	4	5
55.因為這是工作上的要求。……	1	2	3	4	5
56.我不明白完成這項工作與高中教學有何相關性。……	1	2	3	4	5

{請繼續作答}

教學活動之外，您<u>參與校務工作</u>(例如：紀錄學生的出缺席、建立違規檔案、參加行政會議如導師會報、教學研究會）的理由是什麼？	極不符合	不符合	普通	很符合	非常符合
57.因為這是工作上的要求。……	1	2	3	4	5
58.我看不出這項工作的目的為何。……	1	2	3	4	5
59.因為若不能完成這項工作，我會覺得心裡難受。……	1	2	3	4	5
60.因為對這項工作，我樂在其中。……	1	2	3	4	5
61.因為我覺得這項工作對學生的學業成就是重要的。……	1	2	3	4	5
62.我以前知道為甚麼要從事這項工作，但我現在已不知其意義何在。…	1	2	3	4	5
63.因為完成這項工作，對我是重要的。……	1	2	3	4	5
64.因為若不這麼做，我會覺得內疚。……	1	2	3	4	5
65.因為應學校要求，必須這麼做。……	1	2	3	4	5
66.因為我受薪，所以我必須做。……	1	2	3	4	5
67.因為我發現做這個工作是有趣的。……	1	2	3	4	5
68.因為這項工作讓我達成我認為重要的工作目標。……	1	2	3	4	5
69.我不明白完成這項工作與高中教學有何相關性。……	1	2	3	4	5
70.因為完成這項工作，是令人愉快的。……	1	2	3	4	5

您花多少時間填完這份問卷? _____ 分鐘
您在回答上述問題時，是否有遇到任何困難或不了解任何項目？若有，請說明。

您如果願意接受訪談，請留下姓名、email 信箱。您的接受訪談對我的這項研究工作非常重要。感激不盡。謝謝！

_____

_____

_____

_____

謝謝您的作答

Appendix 3.5 Interviewee's Characteristics

Teacher No.	Subject	Sex (F/M)	Age	Years of teaching	Degree	School
T4	Chinese	F	47	22	Master	Xinzhuang H/S
T6	Chinese	F	49	22	Master	Xinzhuang H/S
T8	Chinese	F	51	25	Bachelor	Xinzhuang H/S
T19	Chinese	F	30	7	Master	Panchiao H/S
T20	Chinese	M	39	9	Master	Panchiao H/S
T28	Chinese	F	27	1	Master	Daxi H/S
T2	English	F	43	19	Master	Xinzhuang H/S
T3	English	F	40	16	Master	Xinzhuang H/S
T5	English	F	48	25	Master	Xinzhuang H/S
T17	English	F	30	3	Master	NeiHu H/S
T25	English	F	35	10	Master	PingJen H/S
T27	English	F	30	4	Master	Daxi H/S
T10	Social/S	M	46	22	PhD	Xinzhuang H/S
T12	Social/S	F	51	21	Master	NeiHu H/S
T15	Social/S	M	34	4	Master	HsinTien H/S
T18	Social/S	F	51	25	Master	Panchiao H/S
T30	Social/S	F	35	8	Master	Xinzhuang H/S
T7	Maths	F	40	16	bachelor	Xinzhuang H/S
T9	Maths	F	43	19	Master	Xinzhuang H/S
T14	Maths	F	49	25	Master	Xinzhuang H/S
T16	Maths	F	48	25	Master	NeiHu H/S
T22	Maths	M	46	18	Master	PingJen H/S
T26	Maths	M	51	25	Master	PingJen H/S
T1	Science	F	45	16	Master	Xinzhuang H/S
T11	Science	M	31	4	Master	Xinzhuang H/S
T13	Science	F	44	19	Master	First Girls H/S
T21	Science	F	40	13	Master	Panchiao H/S
T23	Science	M	48	22	Master	First Girls H/S
T24	Science	M	36	11	Master	First Girls H/S
T29	Science	M	46	18	Master	Chenggong H/S
Total	30					

Appendix 3.6 A Interview Schedule (Pre-Pilot Study)

1. What do you think is the main role of a high school teacher?
2. What do you think is the responsibility of a high school teacher?
3. What is your view of teaching? What do you think is the aim of teaching?
4. In your opinion, what are indicators of good teaching? Why?
5. What are the most common strategies that you will employ in teaching? What are your reasons or principles for choosing these strategies? (What are the most important things you can do to enhance students' learning?)
   5.1 Do you believe that there is a need to teach different things in different ways to different students?
   5.2 Do you believe that students learn differently? If so, in what ways? Can you offer some illustrative examples?
6. What is your view of learning? What do you think is the purpose of good learning?
7. In your opinion, what are indicators of good learning? Why?
8. What do you think is the role and responsibility of the student?
9. Finally, in your opinion, "A teacher is like_____because_____." "The teaching is like_____because_____." "A student is like _____ because _____."
10. Please feel free to add any comments you like on the above-mentioned issues.

Appendix 3.6 B Interview Schedule (Pre-Pilot Study)

訪談大綱

1. 您認為高中老師扮演的主要角色是什麼？
2. 您認為高中老師的責任是什麼？
3. 您認為「教學」是什麼？請您談談「教學目標」是什麼？
4. 您個人見解，「好的教學」的指標是什麼？為什麼？
5. 您最常採用的教學方法是什麼？您採用這些方法是基於什麼理由、信念？

   -您認為對不同的學生需要用不同的方式來教導嗎？

   -您認為學生有學習上的不同嗎？如果是，是哪些方面？請簡單舉例說明您如何因應這些不同。
6. 您認為「學習」是什麼？請您談談「學習的目的」是什麼？
7. 您個人見解，「好的學習」的指標是什麼？也就是說，您希望學生學到些什麼（學習成果）？
8. 在「學」這一方面，您認為學生應扮演的角色和責任是什麼？
9. 請您以「老師就像是...」「學生就像是...」簡單一句話來造句

   您認為「老師」和「學生」像什麼？為什麼？請簡單說明。
10. 您對本次訪談內容是否還有補充？請指教。

Appendix 3.7 A Interview Schedule (Pilot Study)

1. What do you think is the main role of a high school teacher?
2. What do you think is the responsibility of a high school teacher?
3. What is your view of teaching? What do you think is the aim of teaching?
4. In your opinion, what are indicators of good teaching? Why?
5. What are the most common strategies that you will employ in teaching? What are your reasons or principles for choosing these strategies? (What are the most important things you can do to enhance students' learning?)
    5.1 Do you believe that there is a need to teach different things in different ways to different students?
    5.2 Do you believe that students learn differently? If so, in what ways? Can you offer some illustrative examples?
6. What is your view of learning? What do you think is the purpose of good learning?
7. In your opinion, what are indicators of good learning? Why?
8. What do you think is the role and responsibility of the student?
9. Please feel free to add any comments you like on the above-mentioned issues.

Appendix 3.7 B Interview Schedule (Pilot Study)

訪談大綱

1. 您認為高中老師扮演的主要角色是什麼？

2. 您認為高中老師的責任是什麼？

3. 您認為「教學」是什麼？請您談談「教學目標」是什麼？

4. 您個人見解，「好的教學」的指標是什麼？為什麼？

5. 您最常採用的教學方法是什麼？您採用這些方法是基於什麼理由、信念？

   5.1 您認為對不同的學生需要用不同的方式來教導嗎？

   5.2 您認為學生有學習上的不同嗎？如果是，是哪些方面？請簡單舉例說明您如何因應這些不同。

6. 您認為「學習」是什麼？請您談談「學習的目的」是什麼？

7. 您個人見解，「好的學習」的指標是什麼？也就是說，您希望學生學到些什麼（學習成果）？

8. 在「學」這一方面，您認為學生應扮演的角色和責任是什麼？

9. 您對本次訪談內容是否還有補充？請指教。

Appendix 3.8 Interview Schedule (Main Study)

訪談大綱

1. 您認為高中老師扮演的主要角色是什麼？

2. 您認為高中老師的責任是什麼？

3. 您認為「教學」是什麼？請您談談「教學目標」是什麼？

4. 您個人見解，「好的教學」的指標是什麼？為什麼？

5. 您最常採用的教學方法是什麼？您採用這些方法是基於什麼理由、信念？

   5.1 您認為對不同的學生需要用不同的方式來教導嗎？

   5.2 您認為學生有學習上的不同嗎？如果是，是哪些方面？請簡單舉例說明您如何因應這些不同。

6. 在「學」這一方面，您認為學生應扮演的角色和責任是什麼？

7. 您個人見解，「好的學習」的指標是什麼？也就是說，您希望學生學到些什麼（學習成果）？

8. 您對本次訪談內容是否還有補充？請指教。

Appendix 3.9 Interview Timetable

Date	Time	School	Teacher's Name	Questionnaire No.	Interview No.
21/11/2011	13:00				
25/11/2011	14:30				
07/12/2011	11:00				
07/12/2011	14:00				
07/12/2011	15:30				
12/12/2011	13:00				
13/12/2011	14:00				
14/12/2011	15:00				
15/12/2011	13:00				
15/12/2011	14:00				
15/12/2011	15:30				
19/12/2011	09:30				
19/12/2011	11:00				
21/12/2011	10:00				
26/12/2011	09:00				
26/12/2011	10:00				
27/12/2011	16:00				
28/12/2011	10:00				
28/12/2011	11:00				
29/12/2011	14:00				
29/12/2011	15:00				
30/12/2011	15:00				
02/01/2012	09:00				
02/01/2012	10:30				
03/01/2012	15:00				
03/01/2012	16:00				
05/01/2012	13:00				
05/01/2012	15:00				
06/01/2012	16:00				
06/01/2012	17:00				

Appendix 3.10 A Consent Form

Consent for Participation in Interview Research

I volunteer to participate in a study undertaken by Tai-Ling Tsao from Durham University in UK. I understand that the research is designed to gather information about senior high school teachers' current working situation. I will be one of approximately 30 people being interviewed for this research.

My participation in this research is voluntary. If I feel uncomfortable in any way during the interview session, I may withdraw and discontinue participation at any time and I have the right to decline to answer any question or to end the interview.

The interview will last approximately 45-60 minutes. Notes will be written during the interview and an audio tape of the interview and subsequent dialogue will be made.

I understand that the researcher will not identify me by name in any reports using information gained from this interview and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction and I voluntarily agree to participate in this study.

I have been given a copy of this consent form.

My Signature

_____

My Signature Date

_____

For further information, please contact:

02-29912391 ex 556

0921-879-236

Email: doralindatsao@yahoo.com.tw

Tai-Ling Taso

Appendix 3.10 B　　Consent Form (Chinese Version)

訪談邀請書

您好，
首先感謝您在百忙中閱讀這份邀請書，希望藉由這份邀請書能使您對於即將　進行的訪談有更進一步的瞭解。

本研究的目的旨在**探討高中教師從事教學工作的現況**。希望藉由訪談能分享　您豐富的教學經驗，彙整您的觀點，讓本研究得以借重您寶貴的經驗與看法順利進行。

本研究訪談時間約為 45-60 分鐘。為方便分析資料，訪談的過程中將進行錄音。事後並將錄音的內容轉化為文字稿，以作為分析資料、編碼及因素歸類之用。

關於訪談內容，絕對保密。且全部的資料僅供撰寫論文之用，絕對不予以公開，請您放心。若在訪談過程中有任何疑問或不清楚的地方，歡迎隨時指教，指正。

本研究需要您的支持與參與。承蒙協助，衷心感激。

敬頌
教　安

英國德倫大學教育博士班研究生
曹黛玲　敬上

訪談同意書

經由研究者說明研究目的與過程後，本人已瞭解研究的目的與價值。茲同意參與研究訪談，提供個人的經驗與觀點，做為論文分析的資料。

在研究者遵守保密原則、保護個人的隱私，即不公開研究參與者的個人資料下。本人同意錄音紀錄資料，做為學術研究之用。

研究參與者:
研　究　者:
日期:_____年_____月_____日

Appendix 7.1A Categories of Conceptions of the Teacher's Role

From the analysis of teachers' responses, five qualitatively different ways of the role of the teacher were identified. The teacher' role was conceived (1) as transmitting knowledge; (2) as a role model; (3) as facilitating learning; (4) as developing character; and (5) as nurturing students.

Category 1: Teacher role as transmitting knowledge (knowledge transmitter)

In this category, the teacher's role was seen as transmitting knowledge, i.e., imparting facts and information to students.

Here are three examples.

> The main role of a teacher is to transmit knowledge from the textbook… The knowledge from the textbook is very rich and for students, it is very difficult for them to learn chemistry. … So the role of the teacher is like "a bridge" which leads students to understand the textbook, important definitions and symbols... I transmit knowledge from the textbook to the next generation. (T1 – 45-yr-old: science)

> I often talk to my students, "just as Han Yu says, "What is a teacher? A teacher is the one who shows you the way of being human, teaches you knowledge and enlightens you when you are confused". The role of a teacher is to teach students knowledge. When I stand on the platform, I deliver knowledge... (T7 – 40-yr-old: maths)

> The main role of a high school teacher is to transmit knowledge because high schools are dominated with knowledge delivery. So teachers have to guide students to learn knowledge. (T24 – 36-yr-old: science)

This category of definition agrees with the definitions by Han Yu, one of the most widely recognized scholars and educators in the Tang Dynasty, who summarized three different roles of a teacher in his book Shi Shuo (On Teachers): "What is a teacher? A teacher is the one who shows you the way of being human, teaches you knowledge, and enlightens you when you are confused" (Liu, Z, 1973, p. 754, cited in Gao & Watkins, 2002). Specifically, one of the three roles of being a teacher in the Chinese culture is to teach students knowledge.

Category 2: Teacher role as a role model

Within this category, the teacher's role was viewed as a role model of correct "moral character" toward one's work and the society, i.e., to exemplify the behaviours, values, and knowledge to be learned. Three quotes illustrate this.

> A teacher should set a good example for students to follow…She should teach students by personal example as well as verbal instruction. (T3 – 40-yr-old: English)

> A teacher should lead students by example…A teacher should be a good model. Senior high school students learn things by example. Just as parents are economical, their children dare not waste money. It is important for teachers to teach by personal example. (T15 – 34-yr-old: social studies)

> A teacher should set examples for students to follow. How teachers deal with problems, treat students, and teaching attitude will have great influence on students. Students will acquire their teachers' attitude toward people and things. (T24 – 36-yr-old: science)

These conceptions may be based on Confucian philosophy which emphasizes the exemplary effects of teachers. That is, for Confucius, the role of teachers is not so much to explain or discuss what is good or right as to show it directly in their lives (Shim, 2008) and knowledge was to be passed on through role modelling (Pratt, 1992).

Category 3: Teacher role as facilitating students to learn

Teachers saw their roles as a guiding process in order to facilitate students to understand and acquire knowledge. For example, a teacher talked about her role as designing optimal 'learning environment' to arouse students' interest to learn English.

> I will …design a learning environment just like a house. I will arrange a closet, a sofa, and drawers in good order. Students can get any information from this learning environment. My role is to design a learning environment and students can take information at will. This is mainly because I want to arouse students' interest and hope they can learn the method. (T2 – 43-yr-old: English)

Two teachers viewed their roles as facilitators who helped students develop critical thinking and understanding of the subject.

> A teacher should guide students to think, find problems and be willing to accept different ideas... I have discussion for many chapters… I do not tell students what is right but give students questions to think about and then they have to make a judgment. (T21 – 40-yr-old: science)

> I will give questions for students to think the story behind articles or the intention the author tries to convey … I will let them be engaged in learning by asking questions. (T21 – 30-yr-old: Chinese)

These conceptions the teachers held may be traced back to Plato's view of the role of the teacher as an intellectual guide who leads or guides students to search for truth through knowledge (Shim, 2008).

Category 4: Teacher role as developing students' character

The teacher's role within this category is viewed as moulding or developing the 'character' of learners. Five quotes illustrate this.

> …because I know students will have no one to guide them about the moral education after they go to college. So I consider I am the last "goalkeeper" of moral education. (T2 – 43-yr-old: English)

> …Teachers should help students develop moral conduct… construct the system of values, moral affection... (T30 – 35-yr-old: social studies)

> A teacher has to help students to build up a better attitude so that they can be more flexible and adaptable to college life and the society. (T5 – 48-yr-old: English)

> I want high school students to know a sense of honour and responsibility after they graduate from the senior high school. Sweeping the floor has many benefits...I think we can see a

> person from the way he sweeps the floor. So the responsibility of a high school teacher is to instil a sense of responsibility and honour into students. (T14 – 49-yr-old: maths)

> Teachers are endowed with the responsibility of education. That is, teachers have to educate students' character, personality, a sense of responsibility, and respect... (T29 – 46-yr-old: science)

The teachers making these statements were aware of their responsibility to shape students' morality and wanted to help students develop good attitude toward learning, correct their wrong behaviours, teach them a sense of responsibility, and shape students' good character. The above-mentioned statements were consistent with Meyer's (1988) study that Chinese teachers had the parent-like responsibility of guiding students' everyday behaviours.

Category 5: Teacher role as nurturing students

Teachers saw their roles in this category as supporting students' emotion and feelings by offering a feeling of empathy, listening to their voices, and giving encouragement as well as advice. Three quotes illustrate this.

> The role of a friend is to encourage and care for students so that they can feel someone understand them and be in their shoes. ..In doing so … Perhaps we may not help them solve the problem, but they feel we are their supporters or they have an outlet. (T29 – 46-yr-old: science)

> A teacher is a supporter of the students…a listener who tries to understand their students' inner thoughts and uniqueness. Let students feel I appreciate their speciality. I think I play the role of a supporter, who accompanies them, hoping they can develop well... (T17 – 30-yr-old: English)

> A teacher's responsibility is to care for students. Senior high school students are often faced with problems of friends, lovers, or family. They need someone to listen to their confusion and conflicts. I think a teacher is like a companion who keeps the company with them... (T28 – 27-yr-old: Chinese)

Within this category, the teachers believed that genuine regard for the welfare of students was to have a sense of caring and interpersonal regard through the expression of friendship and concern for the personal well-being of students (Pratt, 1992).

Appendix 7.1B Conceptions of Teacher Role Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of teacher role / Subject	Transmitting knowledge TR-1	Role model TR-2	Facilitate learning TR-3	Developing character TR-4	Nurturing students TR-5
Soft Area	7	4	10	12	11
Chinese	2	2	4	3	4
C- T4 (2)			TR-3		TR-5
C- T6 (1)	TR-1				
C- T8 (3)		TR-2	TR-3		TR-5
C- T19 (4)		TR-2	TR-3	TR-4	TR-5
C- T20 (2)	TR-1			TR-4	
C- T 28 (3)			TR-3	TR-4	TR-5
English	3	1	3	5	4
E- T2 (3)			TR-3	TR-4	TR-5
E- T3 (2)	TR-1	TR-2			
E- T5 (2)	TR-1			TR-4	
E- T17 (3)			TR-3	TR-4	TR-5
E- T25 (3)			TR-3	TR-4	TR-5
E- T27 (3)	TR-1			TR-4	TR-5
Social studies	2	1	3	4	3
So – T10 (3)	TR-1			TR-4	TR-5
So – T12 (2)	TR-1			TR-4	
So – T15 (4)		TR-2	TR-3	TR-4	TR-5
So – T18 (2)			TR-3		TR-5
So – T30 (2)			TR-3	TR-4	
Hard area	9	2	4	7	7
Maths	5	0	1	5	2
M- T7 (2)	TR-1			TR-4	
M- T9 (3)	TR-1			TR-4	TR-5
M- T14 (2)	TR-1			TR-4	
M- T16 (1)	TR-1				
M- T22 (3)	TR-1			TR-4	TR-5
M- T26 (2)			TR-3	TR-4	
Science	4	2	3	2	3
S- T 1 (1)	TR-1				
S- T11 (3)		TR-2	TR-3	TR-4	
S- T13 (2)	TR-1				TR-5
S- T21 (2)			TR-3		TR-5
S- T23 (2)	TR-1				
S- T24 (3)	TR-1	TR-2			
S- T29 (3)			TR-3	TR-4	TR-5
In Total	16	6	14	19	16

Appendix 7.2A Categories of Conceptions of Teaching

From the analysis of teachers' responses, five qualitatively different ways of teaching emerged. Teaching was understood (1) as transmitting knowledge; (2) as "to teach and to learn" (mutual learning); (3) as facilitating learning; and (4) as developing character.

Category 1: Teaching as transmitting knowledge

In this category, teaching was viewed as transmitting knowledge in the textbook or teaching syllabus based on the curriculum. Those in this category described their teaching as delivering content in the textbook and preparing the student for the Joint College Entrance Examination (JCEE). Here are four examples.

> Teaching is to teach the content in the textbook. Perhaps students will not use it in the future, but this is the basic ability they must possess when they enter the college. Because students have to take the JCEE, I have to teach syllabus based on the national curriculum. (T9 – 45-yr-old: maths)

> Teaching is to deliver concepts in one unit clearly. Math is composed of units... Teaching is to teach definitions, formula, and prove formula. It is a kind of thinking training to watch the proof of formula…The aim of teaching… I want students to get high exam scores. (T7 – 40-yr-old: maths)

> Teaching is to teach content which is designed by the national curriculum. The aim of teaching is to let students understand what you teach and use it to take exams. (T6 – 49-yr-old: Chinese)

A physics teacher emphasized the importance of closely following 'the curriculum guidelines' in teaching as account of the preparation of the student for going to college.

> The content of teaching should be based on the curriculum guidelines designed by the ministry of education... Students in Taiwan have to go to college so the content of teaching should meet the "spirits of the curriculum guidelines". Ninety per cent of the syllabuses on the curriculum guidelines must be completed in our teaching. (T23 – 48-yr-old: science)

A Chinese teacher emphasized the significance of the teacher's 'interpretation' of the materials in the process of teaching.

> Teaching is to use my own word and the form of life to interpret articles. If teachers only teach knowledge in the textbook, but teachers do not contain in teaching. I will feel it is empty. I will try my best to introduce an article and let students connect with the article through me. I think the whole concept of teaching is: a text can be connected with students through my interpretation. (T19 – 30-yr-old: Chinese)

Fox (1983) describes these teachers as "conscientious transferrers" who "spend a great deal of time preparing the material and making sure that it is accurate and up-to-date." (p. 152). These teachers took a view that the integrity of the subject-matter must be of great significance; and saw their job as "one of processing very tough material into more easily digestible nutrient for rather simple minds" similar to "a baby food manufacturing analogy" (Fox, 1983, p. 153).

The teachers within this category held a view that the focus of teaching was knowledge in the textbook or curriculum. This conception is in line with Fox's (1983) transfer theory that knowledge was regarded as a commodity to be transferred from one vessel to another.

Category 2: Teaching as "to teach and to learn" (mutual learning)

Teaching in this category was seen not as one-way knowledge transmission, but as two-way teaching, i.e., a mutual learning. Three quotes illustrate this.

> Teaching is relational. In the process of teaching, I am learning. If students do not understand what I teach, I have to reflect on my teaching methods. In doing so, I can learn. Therefore, teaching should not be fixed, but needs change… (T10 – 46-yr-old: social studies)

> In the process of teaching, I help others learn and I also learn from them. Teaching benefits teachers as well as students. In the process of knowledge transmission, there are new discoveries. When teachers prepare lessons, they learn something new. Students are also subjects of change and so do teachers. So jiao xue xiang zhang (teaching benefits teachers and students alike). (T30 – 35-yr-old male: social studies)

A teacher used a metaphor 'running' to express his idea of two-way teaching.

> I feel teaching is like running. I hope students can run after me. The process of teaching is like the process of running. Teachers cannot stop and wait for students. They have to amend their steps to be with students. I regard teaching as teachers' running from one stop to another stop with students. It means that not only students are learning but also I am learning. (T20 – 39-yr-old: Chinese)

Those in this category described their teaching as teaching and learning. This view may be dated back to Confucius' concept of learning, who tried to cultivate himself by continuously studying and teaching. Hall and Ames (1987, p. 44) pointed out that the original character of 學 (to learn) is 斆 (to teach); scholars during the pre-Ch'in period sought to become learned men through teaching as well as learning. That is, "to learn" in the Chinese character indicates that personal growth is through the mutual efforts of teaching and studying (Shim, 2008). The view (to teach and to learn) may also be traced back to the Book of Rites, which states "jiao xue xiang zhang" (teaching benefits teachers and students alike). The aforementioned reasons may account for the teachers' concept that teachers not only help students grow but also improve themselves by teaching students through the reflection on their teaching.

Category 3: Teaching as facilitating understanding

In this category, teaching was viewed as facilitating the development of understanding of knowledge. For example, a teacher described that the outcome of the teaching process was that students understood concepts of the subject and demonstrated this by applying the knowledge to their lives.

> Teaching is to teach basic knowledge in the textbook and then students apply it to their lives…, to identify with the social norm and systems, and thereby to have independent thinking... (T15 – 34-yr-old: social studies)

Another teacher talked about her awareness of the disadvantage of the method of knowledge transmission and knew she could influence students' learning outcomes; thus, her teaching became a process of helping students understand concepts and develop critical thinking.

> The method of transmitting knowledge is not good enough. We let student learn things on the surface and students do not have the ability to discuss matters. I teach many students and know their confusion about some concepts. I think teaching should let students have more chances to think and debate… I will give students questions to discuss and help students think concepts clearly … I will design activities for students to discover and challenge their original ideas or concepts. (T21 – 40-yr-old: science)

The teachers within this category viewed teaching as facilitating the intellectual development and personal autonomy of their students. Knowledge was not taken-for-granted, but open to question and to be interrogated.

Category 4: Teaching as developing character

In this category, teaching maintained a concern for delivery of content but added a dimension – the development of students' character. For instance, below are three examples of describing teaching as a process of helping students change their attitude toward learning and their lives and further shape their character.

> …The aim of teaching includes not only knowledge but also an attitude... Grades are not the most important aim of my teaching. As long as students make efforts though their grades are poor, I will say to them, "Your attitude is 100 points." Your attitude will influence your future and you should use this attitude to learn physics. (T29 – 46-yr-old: science)

> … Teaching is to inspire a person's knowledge and character. I believe that what kind of a teacher will produce what kind of students. Teaching is to teach knowledge and character. Students can become a kind of person whom their teachers want them to be. (T28 – 30-yr-old: Chinese)

> …besides teaching knowledge, the aim of teaching should contain teaching students how to conduct themselves and to be good people. (T29 – 46-yr-old: science)

This conception contains two elements of teaching: first, there is responsibility to deliver useful content; second, there must be an aspect of 'morality education' toward the content. These two aspects are complementary to each other. The teachers in this category tended to emphasize the development of the students as people with good character. In a sense, teaching was explained as a way of socializing students into cultural values (Pratt, 1992a). These cultural values may be rooted in Confucius' teaching which focuses on the student who becomes a man of character rather than knowledge (Shim, 2008).

Appendix 7.2B Conceptions of Teaching Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of teaching / Subject	Transmitting knowledge T-1	Mutual learning T-3	Facilitating learning T-4	Developing character T-5
Soft Area	4	7	4	3
Chinese	2	2	2	1
C- T4			T-4	
C- T6	T-1			
C- T8		T-3		
C- T19			T-4	
C- T20		T-3		
C- T 28	T-1			T-5
English	2	3	1	1
E- T2			T-4	
E- T3		T-3		
E- T5	T-1			T-5
E- T17		T-3		
E- T25		T-3		
E- T27	T-1			
Social studies	2	2	1	1
So – T10		T-3		
So – T12	T-1			
So – T15			T-4	T-5
So – T18	T-1			
So – T30		T-3		
Hard Area	9	2	1	3
Maths	5	1	0	1
M- T7	T-1			
M- T9	T-1			
M- T14	T-1			
M- T16	T-1			
M- T22		T-3		
M- T26	T-1			T-5
Science	5	1	1	2
S- T 1	T-1			
S- T11	T-1			
S- T13	T-1			
S- T21			T-4	T-5
S- T23	T-1			
S- T24	T-1			
S- T29		T-3		T-5
In Total	16	9	5	6

Appendix 7.3A Categories of Conceptions of Good Teaching

Five categories of good teaching emerged. Good teaching was seen (1) as transmitting knowledge in a comprehensible way, (2) as good academic performance, (3) as joyful teacher-student interaction, (4) as facilitating students to become active/ independent learners, (5) as developing students' character.

Category 1: Good teaching as transmitting knowledge in a comprehensible way

In this category, good teaching was seen as transmitting knowledge in a comprehensible way, i.e., teachers who should possess knowledge about "the ways of representing and formulating the subject that make it comprehensible to others" (Shulman, 1986, p. 9). For instance, a teacher talked about providing students' comprehension of knowledge with various teaching methods to broaden their experience base and to develop understanding and skills.

> … If teachers can use films, activities, discussion, oral reports to aid teaching, it is also good teaching. With various ways of presenting information, students can participate in activities and discuss with their classmates and teacher. (T15 – 34-yr-old: social studies)

Another teacher mentioned the importance of organization of presenting information on the blackboard and good ability of language expression.

> First, teachers have to write on the blackboard well. This is a feeling of vision. In physics teaching, writing on the blackboard is like that you are taking notes; that is, it is the whole structure with beautiful words and accurate graphs… Second, teachers must have good capability of language expression. Most students feel suffered if teachers cannot articulate clearly. Teachers should not speak too fast but slow for students to think. They should give students time to think. (T24 – 36-yr-old: science)

These comments show that good teaching was that teachers knew how to present subject-matter knowledge in a comprehensible way while teaching.

Category 2: Good teaching as good academic performance

Good teaching in this category was referred to as students' having good learning outcomes: high academic achievement. For example, below are four examples.

> Students have high exam scores. Having high scores means good teaching. (T20 – 39-yr-old: Chinese)

> The indicators of good teaching are outcomes of learning – student's … good grades. (T3 – 40-yr-old: English)

> Students' good grades are a direct reward. Teachers give students English knowledge and let them to get good grades in the test. (T5 – 48-yr-old: English)

A teacher further pointed out that helping students enter ideal universities could give peace to their body as well as spirit.

> First, help students go to their ideal university. In doing so, students will have peace in their body and mind and soul. (T18 – 51-yr-old: social studies)

Here it is clear that "good grades" were paramount in the Taiwanese high school teachers' minds and they placed high values on external motivators as good teaching.

Category 3: Good teaching as joyful teacher-student interaction

This view saw good teaching as joyful teacher-student interaction in class. One aspect of this good teaching was bound up with pleasant and relaxed atmosphere in class. Here are three examples.

> Students are willing to follow your instruction, interact with you, and ask questions and there is joyful atmosphere in class. (T17 – 30-yr-old: English)

> First, both teachers and students are joyful: students get what they want and teachers teach happily. (T6 – 49-yr-old: Chinese)

> Good teaching is that both the teacher and the students are happy in class. It is good teaching that students are happy to learn this subject. (T16 – 48-yr-old: maths)

Here it could be said that the teachers were recognizing the need for cheerful interaction between the teacher and the student in facilitating students' learning.

Category 4: Good teaching as facilitating students to become active/ independent learners

Good teaching was viewed as generating students' motivation / interest in order to facilitate them to become active/ independent learners. Two science teachers described it as 'motivate students' with which to grab the student's interest and willingness to learn the subject.

> Teachers should spark students' interest and motivate them to learn. Then they will be willing to learn. (T11 – 31-yr-old: science)

> Students are highly motivated to learn this subject. Also they feel interested in this subject. (T13 – 45-yr-old: science)

A math teacher referred to good teaching as teaching students learning methods in the hope that they would become independent learners.

> Good teaching should teach students how to learn math continuously. For example, teach students learning methods such as to preview, do exercises and discuss …Besides, teachers should teach students to have ability to learn new things... (T9 – 43-yr-old: maths)

Here we can see the teachers moving away from transmitting specific knowledge to encouraging the student to have independent and active learning.

Category 5: Good teaching as developing students' character

This view saw good teaching as students' change cognitively/ behaviorally/ affectively.

> ... I do not think having good grades is an indicator of good teaching. It is the moral character of a student that is an indicator of good teaching. (T4 – 47-yr-old: Chinese)

> I hope students can see the warmth behind the literature and become gentle, honest, and sincere people and eventually become the backbone of the country. Furthermore…They should often speak good words, do good deeds, and become good people. (T19 – 30-yr-old: Chinese)

These quotes show that the emphasis of good learning was on good character which was encouraged in the process of teaching.

Appendix 7.3B Conceptions of Good Teaching Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of good teaching / Subject	Transmitting knowledge GT-1	Good academic performance GT-2	Joyful teacher-student interaction GT-3	Active/ independent learners GT-4	Development of students' character GT-5
Soft Area	**4**	**10**	**7**	**7**	**6**
Chinese	1	3	3	3	3
C- T4				GT-4	GT-5
C- T6		GT-2	GT-3		GT-5
C- T8			GT-3	GT-4	
C- T19				GT-4	GT-5
C- T20	GT-1	GT-2			
C- T 28		GT-2	GT-3		
English	1	5	2	4	1
E- T2				GT-4	
E- T3		GT-2		GT-4	GT-5
E- T5		GT-2	GT-3		
E- T17		GT-2	GT-3	GT-4	
E- T25		GT-2		GT-4	
E- T27	GT-1	GT-2			
Social studies	2	2	2	0	2
So – T10			GT-3		
So – T12	GT-1	GT-2			
So – T15	GT-1		GT-3		
So – T18		GT-2			GT-5
So – T30					GT-5
Hard Area	**2**	**2**	**2**	**9**	**0**
Maths	1	1	2	3	0
M- T7				GT-4	
M- T9				GT-4	
M- T14		GT-2	GT-3		
M- T16			GT-3		
M- T22				GT-4	
M- T26	GT-1				
Science	1	1	0	6	0
S- T 1		GT-2		GT-4	
S- T11				GT-4	
S- T13				GT-4	
S- T21				GT-4	
S- T23				GT-4	
S- T24	T-1				
S- T29				GT-4	
In Total	6	12	9	16	6

Appendix 7.4 Conceptions of Teaching Methods of Instruction Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of teaching methods of instruction / Subject	Lecturing (teacher-focused/ content-centred) TM-1	Inquiry/activity (student-focused/ learning-centred) TM-2	Discussion (student-focused/ learning-centred) TM-3
Soft Area	**15**	**7**	**1**
Chinese	5	3	0
C- T4	TM-1		
C- T6	TM-1		
C- T8		TM-2	
C- T19	TM-1	TM-2	
C- T20	TM-1		
C- T 28	TM-1	TM-3	
English	5	3	0
E- T2		TM-2	
E- T3	TM-1	TM-2	
E- T5	TM-1		
E- T17	TM-1	TM-2	
E- T25	TM-1		
E- T27	TM-1		
Social studies	5	1	1
So – T10	TM-1	TM-2	
So – T12	TM-1		
So – T15	TM-1		TM-3
So – T18	TM-1		
So – T30	TM-1		
Hard Area	**11**	**1**	**1**
Maths	5	0	1
M- T7	TM-1		
M- T9			TM-3
M- T14	TM-1		
M- T16	TM-1		
M- T22	TM-1		
M- T26	TM-1		
Science	7	1	0
S- T 1	TM-1		
S- T11	TM-1		
S- T13	TM-1		
S- T21	TM-1	TM-2	
S- T23	TM-1		
S- T24	TM-1		
S- T29	TM-1		
In Total	27	8	2

Appendix 7.5A Categories of Conceptions of the Student's Role

Five categories of student role were emerged. The student's role was conceived (1) as passive recipients; (2) as dutiful/responsible learners; (3) as active learners; and (4) as developing character.

Category 1: Student role as passive receiver

In this category, the student was viewed as a passive recipient of a body of content. Two quotes illustrate this.

> The role of the student is passive. They absorb what I teach. The student does not need to take any responsibility. Their major responsibility is to learn and understand what I teach. The students cannot choose what they want to learn. It is our adults that decide what they need to learn. Therefore, their role is passive. (T1 – 45-yr-old: science)

> Students are students! Students have to cooperate with teachers so they are passive. You are students' friends and then students become your friends. You are their teacher and then they become your students. Students are changed by teachers. Today I control the role: I am a math teacher and then he is my student. I am his friend and then he becomes my friend. (T7 – 40-yr-old: maths)

In this category, the teachers believed that they were in control of everything and what students needed to do was to obey and cooperate with their teachers.

Category 2: Student role as dutiful/responsible learner

The student in this category was regarded as a dutiful or responsible learner who should do their duty to study hard. Four teachers expressed their views of the role of students this way.

> Students have to …do their duty. They have to study hard. (T8 – 51-yr-old: Chinese)

> Students should do their duty: study hard, clean the classroom well, and be attentive in class. (T7 – 40-yr-old: maths)

> They should study hard and make every effort to learn knowledge in the textbook. (T12 – 51-yr-old: social studies)

> …be attentive in class, to ask teachers questions, and to complete assignments. They also need to study in accordance with regular assessments implemented by teachers. ..If students can complete all things their teacher ask them to do, they do their duties. (T13 – 45-yr-old: science)

The conception in this category was expressed in terms of a given standard or expected quality of commitment: students should do their duty, especially making effort or studying hard. It may be based on the premise that Confucian Chinese culture placed high value on effort: effort is considered a very important attribute of a person's success, especially for academic achievement (Chan & Elliott, 2004).

Category 3: Student role as active/ independent learner

Student role was seen as an active and independent learner who learns actively, has ambition for learning, and is passionate for knowledge. For example, a teacher wanted students to take the initiative in learning and to construct their own knowledge.

> …students should seek knowledge and ask questions actively, discuss with his students. (T17 – 30-yr-old: English)

Another two teachers wanted students to extend knowledge beyond the textbook.

> They should learn actively and are willing to learn. Besides, they should have an ambition for learning so they can learn something beyond textbooks. (T9 – 43-yr-old: maths)

> Students should play the role of active learners. They must be passionate for knowledge. Besides, they must seek answers in earnest when they have questions. Moreover, they have to read more outside reading in addition to knowledge in the textbook. (T23 – 48-yr-old: science)

A science teacher further stressed the importance of students' critical thinking.

> …they have to think hard after school… students have to think independently. I often tell students that they have to argue with their teachers about academic questions. Teachers are "the same generation" as students. Teachers and students can discuss together. (T24 – 36-yr-old: science)

This conception includes two elements of the role of the student: active learning and critical thinking. The teachers believed that the process of becoming an independent and active learner was crucial in the personal development of students, a lifelong process that would lead to acquisition of the knowledge, attitudes and skills.

Category 4: Student role as developing character

The student in this category was viewed as a person who should develop one's character apart from knowledge acquisition. For example, a teacher of Chinese considered it important for students to learn gratitude and cherish blessings.

> …another is that he has to show gratitude. Each time a student can answer my question, I always say, "Thank you for your previous Chinese teachers. They had taught you to this idea. With the help of many people, now you are sitting in this classroom. You should know gratitude. Still another responsibility is to treasure blessings. (T4 – 47-yr-old: Chinese)

A female teacher emphasized students' showing concern for the feelings of their teachers and parents and cultivation of a sense of honour and responsibility.

> …Besides, they should consider teachers' feeling. Students have to respond to teachers' teaching and let teachers feel they are learning. ..Furthermore, they must have a sense of honor and responsibility, and empathy. Finally, they should show filial obedience or devotion for their parents. Parents send you to the school and you have to study hard in order to repay them. (T14 – 49-yr-old: maths)

A further quote illustrates a teacher's concern for students' attitude toward teachers and knowledge.

> …Second, students must have good learning attitude. Because of the cram school, students do not show enough respect for knowledge. For example, students impolitely say to me, "I do not understand this part and you have to make me understand it." Or "you teach too fast. I cannot understand." Their attitude is not good. Teachers play the role of knowledge provider. We teach what I have to teach. Students have to change their attitude toward teachers and knowledge. (T19 – 30-yr-old: Chinese)

Another element –character -is added to this conception. The teachers held a view that another important role for students to take is to self-cultivate morally and socially. In terms of moral aspects, students needed to form good attitude, a sense of responsibility and honour. With regards to social aspects, students needed to take into consideration the feelings of their teachers and parents, i.e., relationship with others. The teachers' view echoed to Confucius' belief that the most important purpose of human life is to self-perfect or self-cultivate socially and morally that constitutes the core meaning of learning (Li, 2012).

Appendix 7.5B Conceptions of the Student's Role Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of student role / Subject	Passive receivers SR-1	Dutiful/ Responsible learners SR-2	Active/ independent learners SR-3	Development of character SR-4
Soft Area	**3**	**11**	**8**	**9**
Chinese	2	5	1	5
C- T4		SR-2		SR-4
C- T6	SR-1	SR-2	SR-3	
C- T8		SR-2		SR-4
C- T19		SR-2		SR-4
C- T20		SR-2		SR-4
C- T 28	SR-1			SR-4
English	0	4	3	1
E- T2			SR-3	
E- T3		SR-2	SR-3	
E- T5			SR-3	
E- T17		SR-2		
E- T25		SR-2		SR-4
E- T27		SR-2		
Social studies	1	2	4	3
So – T10			SR-3	SR-4
So – T12		SR-2	SR-3	
So – T15			SR-3	SR-4
So – T18	SR-1			
So – T30		SR-2	SR-3	SR-4
Hard Area	4	12	4	7
Maths	2	6	1	4
M- T7	SR-1	SR-2		
M- T9		SR-2	SR-3	SR-4
M- T14		SR-2		SR-4
M- T16	SR-1	SR-2		
M- T22		SR-2		SR-4
M- T26		SR-2		
Science	2	6	3	3
S- T 1	SR-1	SR-2		
S- T11	SR-1	SR-2		
S- T13		SR-2		
S- T21		SR-2		SR-4
S- T23			SR-3	SR-4
S- T24		SR-2	SR-3	
S- T29		SR-2	SR-3	SR-4
In Total	7	23	11	16

Appendix 7.6 Conceptions of Good Learning Expressed by Chinese, English, Social Studies, Maths, and Science Teachers

Conception of good learning / Subject	Acquisition of knowledge/ application L-1	Good academic performance L-2	Development of ability L-3	Active/ independent learning L-4	Development of good character L-5
Soft Area	**3**	**5**	**0**	**12**	**6**
Chinese	2	2	0	3	3
C- T4		L-2		L-4	
C- T6	L-1				L-5
C- T8				L-4	
C- T19		L-2			L-5
C- T20				L-4	
C- T 28	L-1				L-5
English	1	2	0	5	2
E- T2					L-5
E- T3				L-4	
E- T5		L-2		L-4	L-5
E- T17				L-4	
E- T25	L-1			L-4	
E- T27		L-2		L-4	
Social studies	0	1	0	4	1
So – T10				L-4	
So – T12		L-2			
So – T15				L-4	L-5
So – T18				L-4	
So – T30				L-4	
Hard Area	**4**	**4**	**8**	**2**	**6**
Maths	1	1	4	1	4
M- T7		L-2			L-5
M- T9			L-3	L-4	
M- T14	L-1				L-5
M- T16			L-3		
M- T22			L-3		L-5
M- T26			L-3		
Science	3	3	4	1	2
S- T 1	L-1	L-2			
S- T11	L-1	L-2	L-3		
S- T13			L-3		
S- T21			L-3	L-4	
S- T23	L-1				L-5
S- T24		L-2			L-5
S- T29			L-3		
In Total	7	9	8	14	12

Appendix 7.7 Conceptions of Individual Differences in Learning Expressed by Chinese, English, Social Study, Maths, and Science teachers

Individual Difference / Subject	Ability A1	Motivation/ attitude MA	Learning style LS	Personality P	Gender G	Group G-8
Soft Area	16	8	2	6	6	7
Chinese	3	4	0	3	2	2
C- T4	A-1	MA				
C- T6	A-1	MA		P		
C- T8	A-1	MA		P	G	
C- T19		MA			G	Gr
C- T20						Gr
C- T 28				P		
English	5	3	2	1	1	3
E- T2	A-1	MA				
E- T3	A-1		LS			Gr
E- T5	A-1	MA	LS			
E- T17	A-1				G	Gr
E- T25	A-1			P		
E- T27		MA				Gr
Social studies	3	1	0	2	3	2
So – T10				P	G	Gr
So – T12	A-1					
So – T15		MA			G	
So – T18	A-1				G	
So – T30	A-1			P		Gr
Hard Area	11	6	1	0	1	0
Maths	6	3	0	0	0	0
M- T7	A-1					
M- T9	A-1	MA				
M- T14	A-1					
M- T16	A-1	MA				
M- T22	A-1	MA				
M- T26	A-1					
Science	5	3	1	0	1	0
S- T 1		MA				
S- T11	A-1		LS			
S- T13	A-1				G	
S- T21						
S- T23	A-1	MA				
S- T24	A-1					
S- T29	A-1	MA				
In Total	21	13	3	6	7	7