'Possibility Thinking' and pedagogy in Taiwan's Education System

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Declaration

I, Li-Jung Chien, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Impact Statement

This research is expected to make impacts both inside and outside of academia. The benefits within academia include the identification of the distinctive features of children's possibility thinking (PT) in Taiwan's primary education. Although PT is used in Western theory to great effect, the performance of PT features during the learning activities in the PT model in Taiwan demonstrated a different strength. Moreover, the thesis contributes to the understanding of how the teacher's pedagogical practice influences children's PT performance. By combining the aspects of teachers' creative pedagogy, as proposed by Cremin, Burnard, and Craft (2006) and Lin (2011), this thesis's conceptual framework expands the model by explaining the relationship between children's PT and teachers' pedagogy in the context of Taiwanese education and considering three dimensions—namely, the learner, the teacher, and the environment.

The findings further confirmed that external factors, such as the structure of the curriculum, the class environment, and the implementation of the policy, all contributed to the teachers' pedagogical practice and, consequently, influenced children's exhibition of their PT in different ways. Therefore, this research offers insights into the effect of external social factors and develops an in-depth understanding of the current PT model and its features in 9- to 12-year-olds in the context of PT research in Taiwan.

Outside of academia, the study also contributes to the implementation of policy to promote creativity in Taiwanese education by explaining teachers' difficulties

and needs when attempting to change their usual teaching approach to creative teaching based on the defined policy. Thus, the study highlights the importance of teachers' professional training in creative education and offers several recommendations for the future implementation of creative education policy in Taiwan—namely, that teachers should participate in professional training appropriately designed to enable them to develop a clear understanding of the core concepts of the new policy.

Abstract

Many countries have implemented creativity education during the past decade in order to improve the creativity of their children. The realisation of creativity education not only depends on the curriculum or policy, but also the nature of the pedagogy in the classroom, especially the teacher-children interaction. The curriculum for schools and colleges should focus on 'skills' like learning to learn, communication, critical thinking and problem-solving, ICT, handling information, and literacy and numeracy in order to conceptualise and develop a common understanding of "real" creativity in both learning and pedagogy (Burnard et al., 2006, Craft et al., 2008); however, the importance of "questioning skills" still needs to be emphasised. Craft (2001, 2002) proposes that 'Possibility Thinking' (PT) can be construed as being the engine of everyday or 'little c' creativity (Jeffery and Craft, 2004); furthermore, PT relates to everyday creativity so that 'little c' creativity focuses on individuals' potential to be creative and the everyday problem-solving they encounter during their daily lives (Craft, 2000, 2001). PT can help teachers to interpret the requisite tools for children's creative learning and enable them to understand how creativity manifests itself in learning opportunities across educational settings (Burnard et al., 2006).

Therefore, the aim of this study is to explore what constitutes PT in children's learning experience and how teachers' pedagogical practice fosters their PT as an aspect of creativity in Taiwan's education system. A multiple-case study is utilised as a research approach that focuses on three classes in Taiwanese primary schools with very different characteristics. After reviewing the previous studies of PT and

teacher's pedagogy conducted by Craft, Cremin, Burnard, Dragovic and Chappel (2012), the studies of children's PT for teachers' pedagogy by Cremin, Burnard, and Craft (2006) and Lin (2011) were used as the main approach to this study's conceptual framework.

The preliminary findings indicate that the children's PT corresponded with the teachers' pedagogical practices in different courses and classes and affected the PT of children in these primary schools. Moreover, there was also evidence that external factors, such as policy implementation, curriculum structure, background of classes, and teachers' professional training, all affected the children's PT and the teachers' pedagogical practices and were included in the conceptual framework to explain the current status of Taiwanese primary education in depth in this research.

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Chapter I
Introduction

1.1 Introduction: Background of Creative Education in Taiwan

A great many countries across the globe have implemented creativity education in the past decade to improve the creative thinking and practices of their students. It is clear from many studies that the realisation of creativity education not only depends on the curriculum or policy frameworks, but also the way in which the curriculum and policy are enacted through the pedagogy in the classroom, especially the interaction between teachers and pupils.

The Arts Council England and the Department for Culture, Media and Sport (DCMS) formed a Creative Partnership in 2002 to produce the UK government's flagship creative learning programme. The core belief of this creative partnership was that creative learning and teaching can take place through various activities across the curriculum.

Similarly, Taiwan's Ministry of Education (MOE) published a *"White Paper on Creative Education"* in 2002 with a "bottom-up" promotional strategy from local educational practitioners to the central government (Wu, 2008). The aim of this policy was to create an appropriate environment in Taiwan to motivate participants' desire for innovation and divergent thinking and enhance their willingness to experience the creative process (Chang, Kuo and Wu, 2008).

In 2009, based on the *"White Paper on Creative Education",* the MOE in Taiwan

proposed the implementation of a new programme, *"Future Imagination"* (FI) across the educational system, from elementary schools to universities, for three years from 2011 to 2013. The content of FI was focused on the following seven specific issues at different stages in the Taiwanese educational system (MOE, 2009, p.21);

- Imagining the future of the country and the future of the environment (primary schools – junior high schools; adult education)
- Imagining the future of technology and the future of society (senior high schools)
- Imagining the future of industry and the future of culture (Universities and Colleges)
- Imagining the future of education (enrolment in educational institutions, centres of teacher education and educational policy)

Based on the importance of creativity, imagination and future thinking, the main goal of this policy was to enable students to develop the ability to imagine, create and adopt the future. In addition, the MOE (2009) provided an activity structure composed of six action plans to be implemented at all educational levels from primary school to adult education and more details of this will be provided in a later chapter.

Furthermore, FI also included experimental courses that were based on the formal curriculum with the aim of connecting the different stages and fields of education and strengthening the cooperation between enterprises (MOE, 2009). Above all, FI was not only focused on schools and students, but also teaching and learning, and in view of the close connection between imagination and creativity, FI was intended to foster both of these critical elements in respect of students, teachers and all educational environments.

Understanding the link between creativity and the social context has a number of implications for education. Some scholars, such as Csikszentmihalyi (1996, 1998, 2000), Amabile (1983, 1996), and Sternberg & Lubart (1991, 1995) advocate the study of creativity in a social context. They believe that creativity is ultimately linked to social practices and contexts, regardless of whether it is considered to be a process or an outcome. Csikszentmihalyi and Wolfe (2000) recommend the application of a systems model for creativity in education, since they propose that schooling has three dimensions, namely, students (individuals), materials or a curriculum (domain), and teachers (the field), and that the interaction of these three elements influences the production of creativity. Whether or not schools and teachers are providing these elements to students can be studied and their level of interaction in the programmes or courses can be determined when examining or promoting creativity in education.

In order to conceptualise "real" creativity in both learning and pedagogy and develop a common understanding of it, the curriculum for schools and colleges should focus on 'skills' such as learning to learn, communication, critical thinking, problem-solving, ICT, the handling of information, literacy and numeracy (Burnard et al., 2006, Craft et al., 2008). However, the importance of "questioning skills" still needs to be emphasised and Craft (2001, 2002) suggests that 'Possibility Thinking' (PT) can be construed as the engine of everyday or 'little c' creativity, which involves a shift in the identification, honing and resolution of problems (Jeffery and Craft, 2004). In addition, 'PT' is relevant to everyday creativity, which means that this kind of 'little c' creativity is focused on individuals' potential to be creative and to solve the everyday problems they encounter during their daily lives (Craft, 2000, 2001).Little-c creativity also refers to the processes of using the imagination or creativity in making products, and may also reflect linked to the early learning of the

young children (Craft, 2001; Csikszentmihalyi, 1996). In chapter III (page 73), I provide a more detailed explanation of little-c creativity.

In addition, children can use their PT ability to make the transition from 'what is this?' to 'what can I or we do with this?' and imagine 'as if' they were playing a different role by using their PT (Craft, McConnon & Matthews, 2012). This is because the relationship between the teacher's intervention and the student's self-determination is perceived to be the stimulus to explore the possibilities that drive students' learning (Chappell et al., 2008).

PT generates a new understanding and theoretical development of the type of "what" and "how" questions that are perceived to be an important first step in helping teachers to interpret children's creative learning (Burnard et al., 2006). Moreover, PT can be understood from three perspectives, namely, people or agents, processes, and domains, and it also includes problem-finding and problem-solving (Cremin et al., 2006). Empirical work on PT has been undertaken in three early years' settings in England since 2004. A number of different interlinked features of the engagement of students and teachers with PT in the context of an enabling environment were found in the results of Stage 1 of the PT research (Chappell et al., 2008; Burnard et al., 2006; Cremin et al., 2006). Having achieved the production of the initial model, a new diagrammatic representation was created to more accurately reflect the integration of creative teaching and learning, and further foster the development of PT. This model included activities that involved asking questions, playing, immersion, innovation, being imaginative, self-determination and risk-taking.

On the other hand, many researchers have explored the pedagogical strategies that

could facilitate the development of creativity in the educational context. The concept of creative teaching and the creative actions performed by teachers have been the subject of various studies (Besancon & Lubart; Craft 2005; Jeffrey, 2006; Sawyer, 2004, 2006) many of which have been focused on the three parts: teacher, the classroom context or the teaching content. For example, Lin (2011) proposed a framework of creative pedagogy, which defines the relationship between creativity and pedagogical practices from three perspectives, namely, creative learning, creative teaching, and teaching for creativity (See Page 62). In addition, Cremin, Burnard, and Craft(2006) produced a model of pedagogy that can nurture PT and shows how the features of PT (See Page 67) can be promoted by teacher-child interaction in an enabling context when teachers prioritise children's agency and provide the time and space for them to develop their ideas (Craft, 2015). Moreover, the supportive environment provided by the teacher, the 'standing back' to observe the children's active engagement and the determination of when to intervene are also important elements of the pedagogical model. Based on these models of teacher's pedagogy, a new diagrammatic representation of the conceptual framework model will be described in the chapter IV.

Therefore, the interaction between the teacher and learner is central to this pedagogy, since it can either enhance or limit children's creativity during the learning process. Moreover, it will be argued that understanding individual children's PT can also help teachers to interpret the requisite tools for creative learning and facilitate an understanding of how creativity manifests itself in learning opportunities across all educational settings (Burnard et al., 2006).

In addition, this doctoral research is not intended to only focus on children's role in

their creativity, but also to observe the interaction between them, their teachers and the learning environment. Therefore, the pedagogy of teachers in Taiwan's primary schools is another topic in this research. One of the reasons and also the motivation for me to choose pedagogy as a topic for observation is due to the findings of my Master's dissertation. My master's research was focused on the relationship between the emotional creativity and well-being of Taiwan's primary school teachers, and the results demonstrated the existence of a positive association between their emotional creativity and emotional exhaustion(r＝.10) and their emotional creativity and job satisfaction(r＝.14). Moreover, of four kinds of occupational well-being, the average score of "High Satisfaction-High Emotional exhaustion"(HS-HE) of emotional creativity was higher than that of others (HS-LE, LS-HE, LS-LE) (Chien, 2009). Based on these findings, the role of the teacher is also an important element in this educational context and deserves to be investigated in order to understand teachers' influence on creative education in Taiwan.

Within this broad context, it has emerged that little if any research has been undertaken on children's PT and teachers' pedagogy in primary education in my home country of Taiwan. To address this gap in the research literature the focus of my study is on children aged 9-12, how this age range may exercise PT in the classroom and how this is influenced by the different pedagogical practices of teachers. The aim of this study, therefore, is to examine the relationship between 'PT' and changes in teachers' pedagogy for children aged 9-12, in primary education, that have been engendered by the creativity education programme that was recently introduced in Taiwan.

1.2. Main Research Questions and Purposes

As mentioned earlier, the Taiwanese government has continued to pay attention to the development of students' creativity in education since 2008 and has proposed policies that promote creative education in the educational system. Despite the fact that both researchers and the government emphasise that creativity and imagination are new and important issues, there has been no study of the overall comprehension of children's PT in Taiwan's educational system. Therefore, the aim of this study is to explore what constitutes 'PT' from students' learning experience and how teachers foster individual students' PT as an aspect of creativity. Moreover, the influence of students' PT is an important part of the research, which requires significant attention to obtain in-depth knowledge of PT in Taiwan. Therefore, the following questions need to be answered in order to achieve this aim:

1. **Is there any evidence of PT in Taiwan's primary schools?**
2. **How do children in Taiwan's primary schools use PT during the learning process?**
3. **What is the nature of teachers' pedagogical practices in Taiwan's primary schools?**
4. **What is the relationship between children's PT and teachers' pedagogy in Tawian's primary schools?**
5. **What factors and processes contribute to changing teachers' creative pedagogy and children's PT in Taiwan?**

After answering these questions, some recommendations will be made for the development of teachers' creativity-teaching skills and the implementation of a policy of creative education in Taiwan's educational system.

1.3 Research Design

A holistic multiple-case study was designed and employed in order to answer the research questions by investigating children's performance of their PT and teachers' pedagogical practices used in Taiwanese primary schools. Firstly, a documentary analysis was utilised to analyse the existing research on PT and theories of teachers' creative pedagogy, as well as Taiwan's FI policy and its relationship with creativity in education in order to acquire an in-depth understanding. While there has been a series of empirical studies of PT in the UK and various scholars have proposed clear models and features of children's PT at different stages, research related to PT in Taiwan is rare.

In order to fill this gap, three classes in different primary schools were chosen as case studies with the objective of facilitating an in-depth understanding of children's PT performance based on the pedagogy used by primary school teachers in Taiwan following the implementation of the creative policy, 'Future Imagination (FI)'.The target participants in this study were children aged 9-12 and their teachers from three different classes, two of which have elected to participate in the "Future Imagination policy (FI)" proposed by the Taiwanese MOE, while the third is a primary class that has not adopted the policy. The two classes that have adopted the FI policy can also be divided into different types that are described in Taiwan as a 'primary' class and a 'talented' class. The children in the talented class have been tested and selected from the primary class leave their main class for particular subjects (such as Chinese, Math or Social Sciences) in order to attend some special courses designed by the teachers of the talented class. The backgrounds of the participants will be discussed in detail

in Chapter IV. Although the terms ‘talented class’ is used in Taiwan, it may be regarded as problematic to label children in this way. Further discussion of this issue is provided in Chapter IV (page 131).

These classes were chosen deliberately to demonstrate the potentially different learning interactions between teachers and students in the Taiwanese context. They are likely to provide a better understanding of children’s PT performance and its relationship with teachers’ current pedagogical practices in Taiwan’s primary school education. This approach could also reveal whether or not the implementation of the policy of creative education in Taiwan has made any observable difference to the expression of children’s creativity in school.

A total of 100 hours of classroom observation (35 hours per class) was applied to different subjects in these three primary schools in order to explore the children’s PT performance in depth, observe the kind of pedagogy teachers used during the learning activities in different subjects and classes, acquire first-hand experience of the participants, and record events as they occurred. Video-stimulated reviews (VSR) were used in the classroom to encourage reflection, together with the charting of critical incidents and phases that related to PT and the teachers’ pedagogies. Moreover, short semi-structured interviews with the teachers in the observed classes were also used to understand the difficulties they experienced during their teaching and to explore their ideas about developing children’s creativity in depth. The aim here was to gather in-depth information about their reasons for using particular pedagogies and to ascertain how those pedagogies may have affected the children’s expression of their PT during the learning process.

Data analysis is a process of drawing meaning from data and it is at the core of constructing theory from case studies. A deductive-inductive analytical approach was adopted in this research in order to 'ground' and 'support' the emerging theory and this was followed by two main layers of analyses that were used to test or modify Craft's (2002) PT theoretical model for education in Taiwan. A video-stimulated review (VSR) was firstly applied to video-recordthe100 hours of observation in the three classes and the transcripts of the data included details of the children's verbal and non-verbal behaviour that consisted of posing questions or answering them and teachers' recomposed or leading questions. Secondly, events related to the children's PT performance or different teachers' use of pedagogies were also recorded for three minutes during the classroom observation and the transcripts of these recordings included details of all the interactions between the teacher and the children during these events.

The transcripts were coded using NVivo software to categorise the evidence of teachers' pedagogical practice and children's PT behaviour. Qualitative research was chosen because it is based on 'information-orientated' sampling rather than 'random sampling' and, since each case is unique, it was important to carefully consider the validity and reliability of the research. Yin (2009) indicates that case studies can be generalised to theoretical propositions, but not to populations or universes. This means that the aim of using a case study approach is to generalise a particular set of results to a broader theory (analytical generalisation) rather than to the larger universe (statistical generalisation). Therefore, in this research, the theoretical foundations and goals of the PT model and its relationship with teachers' pedagogy could be re-examined, expanded, or supported by the collected data, while any result from a

particular case is not expected to predict the outcome of other qualitative research.

1.4. Significance

One of the reasons why this thesis is significant is because it is the first and most in-depth study of the development of children's creativity and PT in Taiwan's primary educational system. The lack of such studies will become evident in chapter2, which contains a detailed literature review. With regard to previous studies of creativity in Taiwan, only a few researchers have focused on the role played by PT in primary education or senior education, but neglected to investigate the relationship between children's PT and teachers' pedagogy in depth. Hence, it is expected that this thesis will make a substantial contribution to the knowledge of how children's PT changes with different teachers' pedagogical practices during their learning activities, as well as in response to the implementation of an FI policy in Taiwan's primary education. Based on the research goals, this study is expected to have the following implications on Taiwanese education:

- Understanding the change in teachers' pedagogy and students' PT can reflect the effectiveness of creativity education.
- Research of the creativity education policy in different cultural contexts (i.e. the UK) will facilitate a better understanding of the characteristics of creativity and PT in Taiwan.
- The findings of this study can contribute to teachers' professional development in terms their ability to foster students' creativity.
- The findings of this study can be used to construct indicators by which to evaluate creativity teaching, promote the wider implementation of Taiwan's

creativity policy and influence the development of pupils' creativity in schools.

1.5. Structure of the Thesis

The thesis is divided into eight chapters. The rationale for conducting the study, together with an outline of the research questions and an explanation of the nature of the study, were presented in this introductory chapter.

Chapter Two contains a review of the literature related to the current context of Taiwanese creative education, which includes the implementation of the first creative policy in Taiwan. The second policy applied in Taiwan, entitled 'Future Imagination', is described in the second section of this chapter with an explanation of its purpose, core concepts, and the implication of the FI policy for each stage of Taiwanese education. The way the actual action plan of FI was applied in primary schools is outlined in the third section, together with a list of previous studies related to FI in Taiwan.

Chapter Three is based on a review of the existing international literature related to PT and creative pedagogy. The first part of the chapter contains an explanation of the current features and core concepts of the PT model proposed in the UK based on previous empirical studies. Three different theories related to a creative pedagogy are introduced in the second part of the chapter and also the model of a pedagogy that can nurture PT that was used in previous PT studies. The chapter is concluded with a presentation of the conceptual framework used in the study.

The design of the research and the methods used to complete the study are described

in Chapter Four, which begins with an overview of the research questions and then the design, with an explanation of the choice of a case study approach and the backgrounds of the three cases, as well as the participants in the study. The methods used to collect the data of children's PT performance are also described in this chapter, together with details of the practices deployed by teachers in the classroom activities in the three primary schools. The chapter ends with an explanation of the data analysis process and the ethical considerations observed while conducting the research.

Using the conceptual framework introduced in Chapter Three, the findings that answer research questions one, two and three, are presented in the following chapters. The key themes emerging from the data are analysed in Chapters Five and Six. The findings related to the PT observed in children in the three case study schools are presented in Chapter Five and the children's verbal and non-verbal behaviour in the classroom observation is analysed by reviewing the 11 features of the PT model proposed by the UK researcher. Then, the pedagogical practices used by the teachers during the learning activities are analysed in Chapter Six in order to understand how the teachers used different pedagogies to teach different subjects and classes.

Chapter Seven contains the discussion of the findings related to the impact of external factors on the teachers' pedagogy and the children's PT, which was also mentioned in the conceptual framework in Chapter Three. This chapter is divided into three main parts, namely, the background of the class and the children, the structure of different curricula, and teachers' professional development and the implementation of the FI policy. The importance of the influence of the external factors that could affect the children's PT and the teachers' pedagogy during the learning courses in

Taiwan's educational system is also indicated in this chapter based on the evidence found in the study.

The final chapter, Chapter Eight, contains a summary of the findings in response to the research questions and an acknowledgement of the study's methodological limitations. This is followed by a personal reflection on the research process before discussing the implications of the findings and providing some suggestions for Taiwanese teachers who may be attempting to enhance children's PT. Important directions for future research into children's PT in Taiwan are also presented in this chapter. In terms of the future implementation of the policy on creative education in Taiwan, the chapter and the thesis ends with some suggestions for teachers to be professionally trained to develop children's creativity and imagination.

Chapter II

Creativity Education in Taiwan

This chapter mainly consists of a discussion of the creative education policies applied in Taiwan. The chapter begins with a short introduction to the two policies that are designed to enhance Taiwan's creative education. A detailed description of the policy entitled 'Future Imagination (FI)' is provided in the second section of this chapter because this is the policy that was implemented most recently in respect of creative education in Taiwan and it is also an important element of the structure of this study.

2.1. Programme of Creativity Education in Taiwan

Enhancing creativity has become an increasingly important goal for the Taiwanese government in order to equip society to meet the challenges of a knowledge-based economy. Moreover, many other countries are interested in promoting creativity. For example, the European Commission introduced the *"European Year of Creativity and Innovation 2009"*, which sought to stimulate creative and innovative approaches in different areas of human activity. In addition, the United States and some Asian countries have also attempted to promote creativity in education (Wu, Lin, & Lin, 2002).

According to Chen, Wu and Chen (2008) the development of creative education in Taiwan appears to have been influenced by five main factors, which consist of the revolution and development of education, the development of gifted education, the construction and development of the nation's economy, the tradition of culture and history, and the accessibility of information for the relevant education policy of

Taiwan and other countries (Chen, Wu, & Chen, 2008).

Based on the theory of multiple intelligences posed by Gardner (1999), individual students have different potential and strengths and will exhibit various levels of creative behaviour in different fields. Because these different levels of behaviour cannot be judged as right or wrong, it is evident that different students present multiple ideas in different ways. Hence, it has been important for Taiwan's Ministry of Education (MOE) to appreciate students' multiple styles of behaviour and try to encourage them to discover their ability to be creative during the learning process in order to transform creative education in recent years. Moreover, Taiwan's MOE aims to build a friendly and creative learning environment for students by applying an education policy in creative education, which influences the development of students' thinking style and enables them to display their creative behaviour during learning activities (MOE, 2013).

Whilst endeavouring to implement programmes to foster students' creativity, the ultimate goal for Taiwan's Ministry of Education (MOE) is threefold. Firstly, the government needs to establish an education policy that can encourage and support creativity; secondly, it seeks to develop and institute instructional strategies to implement creative education; and thirdly, it hopes to widen the public's vision of a creative culture (MOE, 2002). The Taiwanese government proposed two leading policy papers on creative education between 2002 and 2011, namely, the *"White Paper on Creative Education" in 2002* and *"Future Imagination Policy" in 2011*(See Figure 2.1).

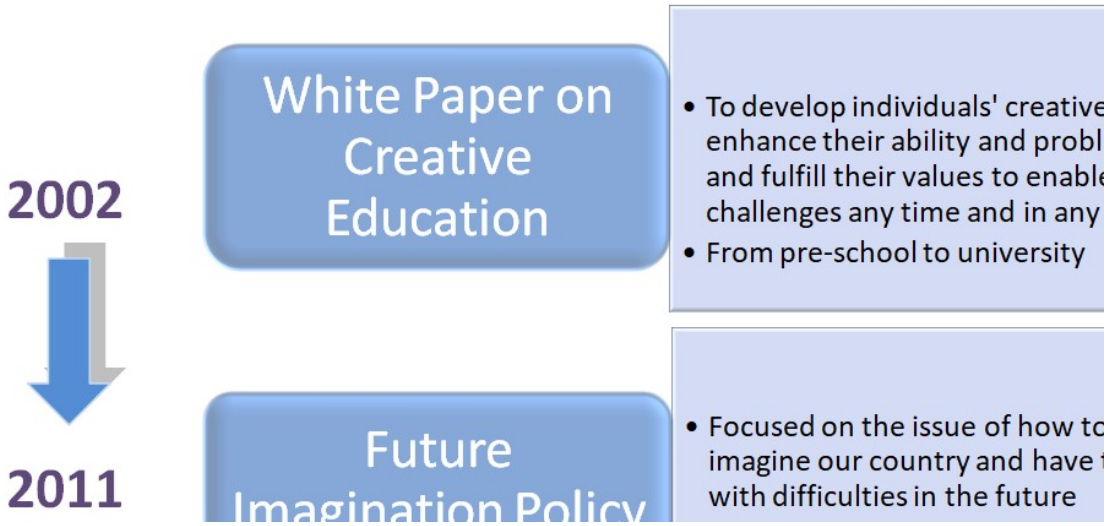

Figure 2.1 The two leading policies on Taiwan's creative education

These two policies took a different approach, but aimed to achieve a similar outcome, that is, that society will have developed creativity or imagination to meet the challenges or difficulties in future or in people's daily lives. These two policies are described in turn below.

I. White Paper on Creative Education

The MOE in Taiwan has initiated a series of projects with the aim of encouraging people to build a "Republic of Creativity" (R.O.C.),[1] which is play on the national title of the Republic of China (R.O.C.). Hence, the aim of implementing this creative educational policy is not only to transform Taiwan's creative education, but also to respect individual students' differences and creative potential, enhance their problem-solving skills and encourage them to exhibit their multiple skills in different fields, as well as to realise their self-worth and achieve self-fulfillment (MOE, 2013). Thus, the 'Republic of Creativity' is a concept in which creativity is encouraged and

[1] 'Republic of Creativity' and 'Republic of China' have a different meaning

expressed at five different levels, namely, individual, school, societal, industrial, and cultural (MOE, 2002).

1. Individual level

The people involved at this level are not only students and teachers, but also administrators, parents and the whole of society. They are encouraged to “think outside the box”, take risks, learn new things every day and experience the true joy of lifelong learning, while feeling free to express their unique individuality.

2. School level

The aim of this level is to build educational institutions with a creative learning climate and active teaching methods. Moreover, schools should try to construct multicultural settings in which creativity, tolerance, individual and cultural differences are embedded in the curriculum and valued by all.

3. Societal level

Abundant intellectual capital is the foundation for people in a knowledge-based economy to adapt to society. The government expects a strong management system to be established, in which creative ideas in a variety of fields can be successfully transformed into innovative products and made accessible to the public in libraries, museums, and other similar places.

4. Industrial level

The implementation of a law to protect intellectual property is a very important issue for different kind of industries, from traditional to high-tech, so that creative ideas and products can be made available for use by the general public. Creative education can

be used to inform people to respect and note the importance of intellectual property and copyrights in order to achieve this goal.

5. Cultural level

The development of an enlightened atmosphere and environment that can enhance creativity is attracting more attention than ever before in order to shape a creative culture in which all people can express their creative ideas at anytime and anywhere. If people live in a friendly place and feel free to share their inspiration or creative thinking in their daily lives, a creative culture can be developed and knowledge can be actively exchanged.

Therefore, the 'Republic of Creativity' is a perspective or approach that aims to foster a creative climate across many different fields in Taiwan. The primary goal of this approach is for creative education to develop individuals' creative potential, enhance their ability and problem-solving skills, and fulfill their values to enable them to meet challenges any time and in any place.

Based on the concept of a 'Republic of Creativity', the MOE published a *"White Paper on Creative Education"* (MOE, 2002) in 2002. Qualitative and quantitative research methods were employed in this report, which contained an observation of education programmes under the MOE at primary school, high school and university levels, both in Taiwan and abroad. This *"White Paper on Creative Education* "was a collaborative work comprised of reports of individual teams and all the feedback and comments that were generously provided by the schools, experts and academic researchers involved in the project (MOE, 2002).

Moreover, six initial action programmes were also proposed in this White Paper, which represented the main issues and different objectives of this policy that should be emphasised, promoted and enhanced (MOE, 2002), namely, Nurturing Tips for Creative Learners, Professional Development for Creative Teachers, Comprehensive Management for Creative Schools, Creative Life in Action, Online Learning through a Creative Resource Bank, and the Ongoing Consolidation of Creativity Cultivation. These six action programmes are described in detail below (MOE, 2002).

1. Nurturing Tips for Creative Learners

This programme aims to not only inspire and encourage students to participate in creative learning activities, but also to enhance their intrinsic motivation for learning, as well as developing their initial creative potential abilities and new ways of thinking and resolving problems. This action plan is focused on students' experience of creative processes and to observe the outcomes of their creative work.

2. Professional Development for Creative Teachers

The MOE hopes that teachers will become active learners who are willing to engage in creative teaching and attend the relevant professional courses to develop their creativity. Therefore, this programme is designed to help teachers to mobilise and cultivate their creative potential and establish a creativity-orientated system for teachers' recruitment, promotion and evaluation.

3. Comprehensive Management for Creative Schools

This programme is designed to reduce parents' pursuit of excellent diplomas and degrees to which they currently pay much attention and to shift society's over-emphasis on "star" schools. A 'star' school in Taiwan is one in which a high

percentage of graduated students attain high scores in the exams for entering their next educational stage. Therefore, many parents in Taiwan strive to send their children to a "star" school in the belief that it will help them to have a good future. However, this programme is designed to change the concept that there is value in pursing exam scores and instead intends to construct creative campuses, foster a creative culture and climate, not only at the teaching level, but also the educational admission level. It also aims to transform schools into learning organisations and develop the unique features of each school.

4. Creative Life in Action

The goal of this programme is to encourage people to bring creativity into their families and homes. It also hopes to combine creative culture with local culture, in order to improve people's quality of life and increase the competitive strength of the nation. Furthermore, the MOE may provide resources for schools, communities, foundations, and other city organisations to promote and develop people's creative ideas and share them with society.

5. Online Learning through a Creative Resources Bank

The aim of this programme is to provide a variety of online information about instructional resources, creative competition, creative works or activities and online learning\teaching websites for teachers, students and the general public. Based on this target, the MOE has established a "*creativity bank*" to collect creative ideas and products in order to assist people to manage their creative intellectual property.

6. Ongoing Consolidation of the Cultivation of Creativity

The aim of this programme is to strengthen the foundation of ongoing research in creativity and innovation by integrating the basic knowledge with unique local cultures, policy-making and implementation, and the practice of creative education in Taiwan. In order to achieve this goal, the MOE should review the outcome to date and then modify the direction of creative education in the future, where necessary.

In short, the final goal of these six initial action programmes is to apply different kinds of resources and strategies to develop a creative culture and establish Taiwan as a "*Republic of Creativity*".

The promotional strategies of the MOE are conceived as "bottom-up", that is stemming from local educational practitioners and progressing to central government (Wu, 2008). Consequently, a Local Creative Education Programme (LCEP) has been established, which comprises five creative programmes, namely, Creative Students, Creative Teachers, Creative Campus, Creative Think Tanks, and Cross Fertilisation. 36, 000 teachers and 120, 0000 students were involved in these programmes between 2004 and 2007, and more than 25 counties or cities have produced their own white paper on the development of local creativity (MOE, 2007).

The aim is to create a supportive climate and an appropriate environment in Taiwan to motivate participants' desire for innovation and divergent thinking, and enhance their willingness to experience the creative process (Chang, Kuo and Wu, 2008).

II. Future Imagination Policy

> ‘Our main leisure activity is, by a long shot, participating in experiences that we know are not real. When we are free to do whatever we want, we retreat to the imagination —to worlds created by others, as with books, movies, video games, and television (over four hours a day for the average American), or to worlds we ourselves create, as when daydreaming and fantasising.
> (Bloom, 2010, p.1)’

According to Bloom (2010), some people’s main leisure activity may be enjoying the fruits of their imagination, even though they know they are not real. Therefore, the time they spend reading novels, listening to stories, watching movies and television programmes, playing on-line games is time spent in a world created by other people. On the other hand, they may also be looking for an opportunity to create their own imaginative world to hide inside when they are bored. For example, when reading novels like ‘The Chronicles of Narnia’, they not only become involved in an amazing world created by the author that underpins and expresses a belief in love, hope, courage and confidence, but their imagination is also stimulated. They may wonder what would happen or what they would do if they lived in that world and encountered the same events.

Moreover, Disney and Pixar animation studios have also produced stories that included many famous imaginary characters like Mickey Mouse, Donald Duck, Woody in Toy Story, and James P. "Sulley" Sullivan in Monsters Inc. Children become immersed in these stories and imaginary worlds and their own imagination is simultaneously fuelled and stimulated. Bill Cones, the production designer of Pixar animation studios believes that imagination and creativity are the most important characteristics of Pixar and of human beings (Wu, 2012; MOE, 2013). In addition,

although not all people have access to these kinds of multiple media, such as movies or TV, they will have some reaction or refection, or their imagination will be aroused, when they encounter external stimulation. Therefore, it is very important for people to have the ability to be imaginative and creative in their daily lives.

On the other hand, individuals are prone to imagining what the world will look like in the future and they are inclined to imagine a very different world based on their diverse emotions or participation. They may also be affected by their previous life experience or global events. Since this experience or these events may cause some negative changes in the future which may also affect these individuals' lives, their imagination can help to protect them and prevent these kinds of incidents from happening again. For example, people pay more attention to the safety of nuclear power plants because of the accident at the Chernobyl Nuclear Power Plant in 1986 and the Fukushima Nuclear Accident in 2011. These accidents severely affected people's lives and harmed human health, as well as creating an environment that will make the earth inhabitable in the future. Therefore, people are reminded to preserve the beauty of the earth for the next generation by cherishing energy and protecting the environment to prevent the recurrence of similar catastrophes. In order to achieve this aim, they are trying to find or create new ways to preserve and reuse natural energy to reduce the use of nuclear fuels as much as possible.

Since technology, knowledge and a variety of media, information or products are innovated and eliminated on an almost daily basis, it is difficult to predict exactly what will happen in the next century. According to Creativity, Culture and Education (CCE) in the UK, more than 60 percent of children who are now studying in high schools may be out of work because few new jobs have been created in recent

years(Wu, 2010, 2011). This means that the current training and preparation of children for jobs will not meet their needs when they are 25 years old because these jobs will not exist in the future. Therefore, the education system needs to find a way to equip the next generation for a future for which they cannot prepare in advance and this is also the aim of the Creative Partnership Project in the UK, which is based on helping children to be job creators rather than job seekers. When the current generation of educators were young, they were taught to have the ability to find a job, but today, children must learn to create jobs to sustain them in the future (Wu, 2010, 2011; MOE, 2013). Thus, as educators, our main mission is to enable children to develop their creativity and imagination in order to construct a sustainable career when they eventually leave school.

The Ministry of Education (MOE) in Taiwan implemented the "Future Imagination (FI) Policy in 2011, which "focused on the issue of how to assist children to imagine our country and have the ability to deal with difficulties in the future, for example, the nuclear issue. By applying this "Future Imagination Policy (FI)", the MOE firstly hoped that children could provide their vision of the future country, family, schooling, and environment. Then, by learning how to imagine and create these beautiful visions, they would develop various perspectives, as well as learn the importance of environmental protection. Finally, the children could propose any 'possible' and 'probable' energy that could be used in the future and then choose their preferred energy to build their own beautiful future (MOE, 2012). By promoting the FI policy, children could develop and express their creativity and imagination for the future country, technology, education, environment and life and then let it 'flow' in the future to deal with all possible challenges.

In terms of the implementation of the FI policy, educators at every stage of the education system are positioned as gatekeepers to a creative future, as an essential means of helping children to develop their creativity and imagination. The implementation of the policy is guided by five main questions: 1. Why do we need to imagine the future? 2. What is future thinking? 3. How can we imagine, think and create a future? 4. Have any other countries promoted FI? How did they do it? and5. What are the aims and stages of this FI policy?

In order to answer these five questions, Chan and Chen (2012) note that the issues people are thinking about and are concerned about are 'Is there a future for human beings?' and 'What kind of future would people like to have or would be good for human beings?' Therefore, it is more important for education to capture points and pose questions about the future than make a correct prediction. In addition, there are different strategies that can help learners to learn how to imagine, think and create the future at different stages, such as creative imagination, future thinking, system thinking, storytelling, future problem-solving, or predicting trends. Since these strategies are recognised as helping children to predict the future, find a future, and resolve future problems (MOE, 2012; Lin, 2011), the rapid changes in global societies and environments have led many countries to pay attention to, and offer various educational programmes or curricula based on the concept of 'Future Imagination'.

For instance, the Department of Writing and Humanistic Studies at the Massachusetts Institute of Technology (MIT) in the US provides a course entitled 'Writing on Contemporary Issues: Imagine the Future' with the aim of helping students to develop their writing ability and skills to write different kinds of articles that entail describing and imagining the future. Furthermore, Microsoft promotes a project entitled 'Partners

in Learning', which consists of three dimensions, namely, creative schools, creative teachers, and creative students, in more than 70 countries in the world, including Taiwan. Microsoft Taiwan cooperated with the Taiwanese Ministry of Education (MOE) in the project, 'Partners in Learning', between 2003 and 2008, and eight schools participated in this five-year project to become 'future schools' in Taiwan. The features of these future schools are not only the high quality of their IT equipment, but also the training for teachers to learn how to incorporate 'Project Based Learning' in their teaching and curriculum.

In Canada, where the traditional approach to education relied on the textbook and lacked connection with the real world, students felt bored and uninvolved with their learning activities (Simon Fraser University, 2011) and this led to the establishment of an 'Imaginative Education Research Group (IERG)' at the Centre for Imaginative Education at the Simon Fraser University. This group proposed that, if teachers and students used their imagination when teaching and learning, the knowledge in the textbook would be more interesting, thereby promoting efficient learning (Simon Fraser University, 2011). Canada's excessive reliance on traditional teaching is an issue shared by Taiwan's educational system (MOE, 2013).

The *United Nations Educational, Scientific and Cultural Organisation* (*UNESCO*) have also published '*Teaching and Learning for a Sustainable Future (TLSF)*'. This is a multimedia teacher education programme with the aim of developing an appreciation of the scope and purpose of education for a sustainable future, and 'Future Problem Solving 'is one of the teaching and learning strategies advocated by this programme.

Moreover, many organisations around the world are also extremely concerned about the future. For example, the Organisation of Economic Cooperation and Development (OECD) delivered its 'International Futures Programme' which consisted of strategic, long-term thinking and horizon scanning of science, technology and innovation since 1990 (OECD, 2009). In addition, some organisations in Taiwan predict and analyse future trends, such as the Research Development and Evaluation Commission of Executive Yuan (RDEC), which implemented a project entitled 'Vision: 2020' in 2009. The main aim of this project was to develop a vision of Taiwanese life in 2020 based on the fact that there was a lack of dreams, visions and critical ideas, despite there being many talented people in Taiwan. The vision of 2020 was developed using a website, workshops and colloquia to gather ideas from the public (RDEC, 2009).

It was also mentioned in the final report of the 8th Science and Technology Meeting, which was published by the National Science Council (NCE), that education should focus more on teaching students to use their imagination in order to enhance their ability to think about the future and develop a variety of views about the fields of science and social science in order to resolve future problems (NCE, 2009). Moreover, the 'White Paper on Creative Education', which was produced in 2002, was also a good platform for promoting the significance and positive influence of imagination on Taiwan's creative education.

Moreover, imagination, creativity, and future thinking have a very close relationship, since imagination is an essential component of creativity. In fact, Willimans points out that imagination is one of the most creative concepts(Barrow, 1988; Duffy, 1998); meanwhile, Francis suggests that the difference between these two elements is that imagination is the ability to describe something that is non-existent, whereas

creativity is the ability to translate something imagined into something concrete (Duffy, 1998). Since creativity and imagination are closely related, despite their different characteristics, children can use them to resolve different kinds of problems in their daily lives.

As mentioned above, the Taiwanese government aims to enhance children's creativity and imagination by promoting the FI policy so that they can 'flow' in the future to deal with all possible challenges in different kind of fields. Although it may not be easy to achieve this goal quickly because change takes time, I believe that enhancing children's creativity and imagination through Taiwan's education system is a good start to building a desirable future by developing the ability of children to resolve the possible problems they may encounter along the way.

Hence, how to enhance children's creativity and imagination is the important issue considered in the FI policy. The difference between children's imagination on the one hand and their creativity on the other also needs to be considered when implementing this policy. Therefore, the focus of my research is whether children's creativity is or is not affected by the FI policy by observing children in primary schools that have implemented this policy.

2.2 Concept of Future Imagination

2.2.1 Future thinking

'What is future imagination?' 'What are the core concepts of future imagination?' 'What are the criteria of the future imagination policy in Taiwan?' These three questions are often posed by educators and researchers when implementing the FI policy (MOE, 2013). Therefore, the concept of future thinking and the definition of

future imagination is presented in this section.

In 2007, the Organisation for Economic Cooperation and Development (OECD) announced that 'future thinking' was a diverse method to generate multiple views to explore possible societal changes in the future (OECD, 2007); in other words, future thinking was based on individuals' ability to imagine or predict the future in the next 10, 15 or 20 years, or even further into the future. While it is impossible for human beings to predict the future, they could imagine or predict some future worlds and examine them to determine the best choice for society. Therefore, future thinking is a process that generates multiple choices and possibilities for the future and facilitates an examination of those choices in order to decide futures issues (MOE, 2013).

On the other hand, imagination is an essential tool for humans to construct an image of a future that is currently non-existent in their world. Singer (1999) also indicates that imagination is a special way of thinking that enables humans to outline images, illusions, or designs for the future by using or reprocessing their existing experience or knowledge in the real world. In short, people can form an image of something that does not exist by using their imagination. Therefore, the use of future-based imagination can help people to cross the boundaries and limitations that currently exist and balance the ideas derived from short-term and long-term thinking in order to create the 'desired' future.

In addition, there is a distinction in the literature between 'future imagination' and 'futurology'. The latter focuses on predicting future trends accurately using scientific methods, while the former emphasises the exploration and investigation of any possible development in the future rather than correctly predicting what the future will

look like (MOE, 2013). In short, futurology can be explained as answering the question, 'what is the future?' while future imagination entails trying to find 'a possible future'. Thus, the findings of futurology, which would be theory-based and accurate, could be used to reduce the limitations for developing an image of the future. For example, the future may be described in a negative way based on futurology, due to current data and previous experience, such as the disastrous effects of global warming on the earth's environment; on the other hand, the aim of future imagination is to build a preferred future by using people's creativity and imagination. The desire to achieve this future will stimulate the actions needed to reduce global warming, such as changing everyday habits and promoting the reuse of materials rather than continuing to produce more plastic, and although we cannot know whether this kind of future will happen or not, it will help people to expand their imagination and make an effort to achieve it (MOE, 2013).

Therefore, according to the above short explanation, the definition of 'future imagination' enshrined in the FI policy is 'The aim of future imagination is to create a "possible" and "preferable" future by exploring and expanding past and current experience' (MOE, 2013).The process and dimensions of future imagination will be discussed in the next section in order to deepen the understanding of this concept and how to 'think the future'.

2.2.2 Process and dimensions of Future Imagination

According to Galtung (1982), the process of thinking the future consists of three dimensions, namely, probable future, possible future, and desirable or preferred future. Determining the probable future entails predicting or assuming the objective future using previous experience, while defining the possible future involves imagining or

creating a variety of possibilities or visions of the future. Finally, determining the desirable or preferred future means exploring and making the correct choice which would be appropriate for the expected future using critical thinking.

Based on these three dimensions of Galtung (1982), Bjerstedt (1982) argued that there should be a fourth dimension, the prospective future, which emphasises the 'readiness to act' of individuals and groups. Gidley, Batemen and Smith (2004) also indicated that the prospective future would transcend the other three traditional dimensions, noting the significance of the integrity and 'empowerment' of the participants. The relationship between the four dimensions of futures and the research paradigm of futurology is illustrated in Table 2.1 (Gidley, Batemen and Smith, 2004).

Table 2.1. Four dimensions of future thinking

Broad Approach	**Probable Future**	**Possible Future**	**Preferred Future**	**Prospective Future**
Description	Trend analysis – global, ecological	Imaginative, creative ideas, flexibility	Values position critical, ideological	Will to act, self-reliance, empowerment
Related Types of Futures Studies	Predictive, quantitative, trend is destiny (One future)	Cultural-interpretive, utopian (Many futures)	Critical, post-modernist, ideological (An "order" future)	Integral, transformational, empowering (Future)
Underpinning Paradigms	Positivist empirical, analytical	Constructive, dialogues collaborative creative visions	Critical, emancipatory	Paradigm shift, transformational, activist
Research Methods	Quantitative, forecasting surveys trend scenarios	Quantitative, dialogues collaborative creative visions	Text analysis, critique of media, cultural, artefacts, visioning	Integral, visioning, action planning, action research
Goal	Generalisation extrapolation	Opening alternative possibilities	Critical awareness, deconstruction	Empowerment, change, transformation

Source: Futures/Foresight in education at primary and secondary levels: A literature review and research task analysis by J. M. Gidley. In R. A. Slaughter (Eds) (2004), Futures in Education: Principles, Practice and Potential (p.7). Melbourne: Swinburne University of Technology.

Although these four futures appear to be very different and even incompatible, they each present an important meaning in future imagination. Firstly, since individuals may imagine or create the future using novel ideas that are inappropriate for the real world scenario, the 'probable future' dimension would be the most efficient means for them to imagine the future using their previous experience or knowledge. While this may not be particularly creative or imaginative, it is the kind of future that is most likely to become reality.

Secondly, if individuals only use their existing experience to predict the future, it may be a limited future without creativity or possibilities. In this case, they would do well to think about the 'possible future' to explore and create any future possibilities. From the perspective of education, individuals would be adversely influenced and produce undesirable results if they only imagined the future without becoming engaged in critical or creative thinking about the negative possibilities. Csikszentmuhalyi (1996) also used the perspective of creativity to assert that the world would be destroyed by creativity if mankind does not know how to create the future.

Therefore, the 'desirable or preferred future' is indeed essential for humanity to make a choice and develop the expected future. Finally, the use of the 'prospective future' to construct the blueprint and action plans could lead individuals to their expected future. In conclusion, although these four dimensions are based on different theories and strategies, they all play an important role in the concept of future imagination (MOE,

2013).

Based on the concepts mentioned above, Torrance (1978) proposed six processes for 'Future Problem Solving', namely, Identify Challenges/Problems, Select the Underlying Problem, Solutions, Generate/Select Criteria, Apply Criteria to Solutions, and Action Plan. Moreover, Cascio (2009) presented five core concepts of designing a course for teaching the future: (1) asking a question, (2) scanning the world, (3) mapping the possibilities, (4) asking the next question, and (5) thinking it through. These two models both focus on exploring future trends to produce a creative image of the future and using critical thinking to examine the solutions or answers to resolve future problems.

Furthermore, based on the related theories, arguments and consensus of 24 experts and academic scholars from a variety of fields, such as creativity and education, science and technology, industry and management, art and social science, information and communication, and futurology, there are four dimensions for constructing future imagination that could be used in classroom practice in Taiwan (See Figure 2.2) (Lin and Chen, 2011; MOE, 2013).

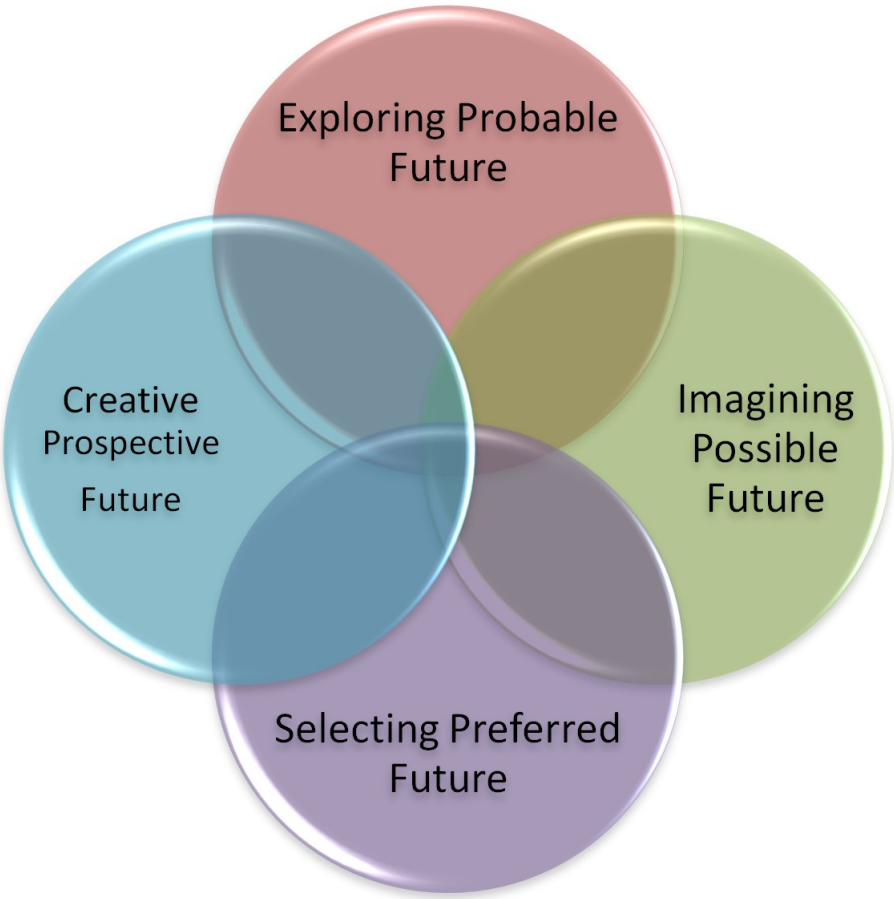

Figure 2.2 Four dimensions of future imagination

Source: Ministry of Education (2013).Future Imagination Education in Taiwan. MOE: Taipei. P.55

(1) Exploring the Probable Future

This entails investigating, developing and intuitively experiencing previous and current contexts in order to explore future probabilities; for example, building the future by investigating the history, culture, geography and key events of the related community, observing all sensations, interviewing elders, or drawing a map. It also involves using developing trends and events which may happen in the future to predict the future development. Chan and Chen (2011) also indicate that teachers should tolerate any seemingly unrealistic or nonsensical ideas proposed by students when they display their creativity and imagination in class.

(2) Imagining the Possible Future

This process entails imagining possible images, innovation, or problems in the future. It is based on using the imagination to develop or create a possible future. Lin and Chen (2011) also established the following five criteria for imagining a possible future;

1. Find, think and define future problems using different points of view.
2. Lead the thinking process with the question, 'What if?' to resolve relevant future problems.
3. Jump out of existing boundaries and create innovation.
4. Use different operational models of imagination to develop future possibilities.
5. Imagine, simulate, and describe possible future contexts.

(3) Selecting a Preferred Future

According to the value analysis, this process entails the use of critical thinking and value reflection to make a choice and analyse the influence of a variety of possibilities for developing the expected future.

(4) Creating a Prospective Future

This process is based on making various plans or taking action to imagine the future and even making some changes to the current world in order to pursue a wonderful world in the future.

Moreover, the above four dimensions of future imagination have a dynamic interaction in the educational system (Lin and Chen, 2011), although not all of them need to be applied when designing teaching activities, since they can operate

individually. For example, ‘Imagining a Possible Future’ could be used to ask students to focus on imagining and thinking about a particular time and space and their ideas could be discussed and evaluated as part of their course work. Secondly, since these four facts are not separate, but have a dynamic interaction whereby each of them can interact with the others, imagining a possible future could be influenced by exploring the probable future or creating the prospective future.

In addition, these four dimensions of FI could be applied one after the other, but there could also be a round application of two dimensions. The assessment of FI should be designed individually for different ages or groups because participants of different ages will focus on different dimensions to develop their thinking, creativity, and imagination. Therefore, the relationship between these four dimensions of FI could be continuous and recurrent (MOE, 2013).

2.3 Future Imagination Policy in Taiwan

In this section, I will consider the application of the concept of future imagination to policy development in Taiwan. The issue of future imagination not only pertains to adults, but also to children and teenagers, teachers and students, leaders of nations, and the entire population. This means that only one perspective of a specific field, subject, or stage of education cannot be expected to resolve the problem of future imagination. The main tools to deal with difficulties that may be encountered in the future are interdisciplinary views and the participation of all citizens, both young and old (MOE, 2013). The Taiwanese government also encourages young people to participate and understand future imagination because they are the next young generation, who will play the main role in the future. Moreover, one of the most

important missions for education is to assist learners to prepare themselves to build a wonderful future. Therefore, some questions about future imagination may need more attention; for example, 'Can the current educational system provide students with sufficient sensitivity toward future trends?' 'Is the content of teaching and curricula in education suitable for helping learners to meet future challenges?' 'Are learners able to imagine the future, adapt to the future, and create the future?' (MOE, 2013)

Based on the *"White Paper on Creative Education",* which was published in 2002*,* the MOE in Taiwan proposed the implementation of a new programme called *"Future Imagination" (*FI) across the entire educational system, from elementary schools to universities, for three years from 2011 to 2013. In terms of the content of the plan, it emphasised the following seven specific issues ;(MOE, 2009, p.21)

1. Imagining the future of the country
2. Imagining the future of industry
3. Imagining the future of culture
4. Imagining the future of technology
5. Imagining the future of society
6. Imagining the future of the environment
7. Imagining the future of education

2.3.1 Structure of the action plan for 'Future Imagination'

Based on the importance of creativity, imagination and future thinking, the main goal of this policy was to highlight the development of students' ability to imagine the future, create the future and adopt the future. In addition, the MOE (2009) provided an activity structure composed of six action plans to be undertaken at all educational levels (elementary school to adult education)(see Figure 2.3), each of which focused

on different educational stages and issues of FI. In addition, the MOE used 'ship', 'navigate' and 'navigation' as metaphors for the action plans. The ship means that the action plans would like to gather children together to explore and investigate any possible futures and then navigate to further develop their future imagination. Therefore, the metaphors used here also refer to the horizon and vision of the FI policy in Taiwan, namely, to lead children, students or people to float in the sea of imagination for a possible preferable future.

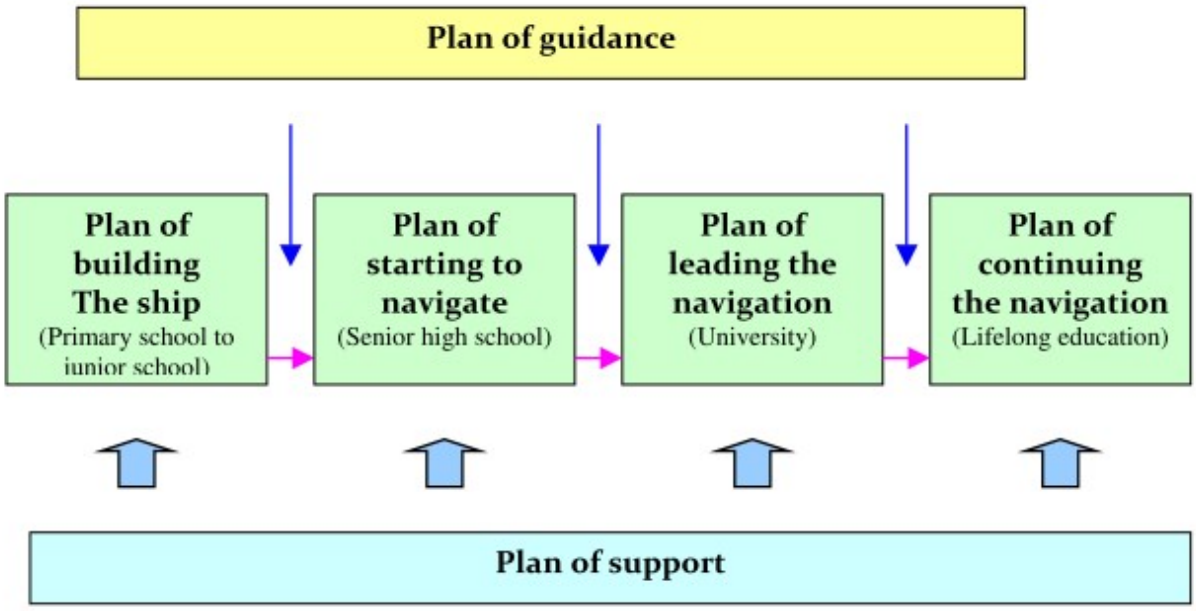

Figure 2.3 Structure of the action plan for 'Future Imagination'

Source: Ministry of Education (2013). Future Imagination Education in Taiwan. MOE: Taipei. P.38

1. Plan of building the ship

According to the Taiwanese government, "Future Imagination" would require long-term investment and involve different stages of education. Firstly, the MOE hoped to build a good basis like a 'ship' in the primary stage of education for further development. Therefore, the 'ship' here is a metaphor for establishing creativity and imagination and it means that the government is implementing this programme with

the aim of developing children's ability to create and imagine for them to use to find possibilities for the future. The ship is also intended to build a creative learning environment for students in early education where they would be encouraged to use their creativity and imagination to resolve different issues they may face in the future, such as climate change or limited energy.

Therefore, this plan focused on how to develop children's imagination and creativity from primary to junior high school when they have diverse and abundant imagination and creativity. Although they may have insufficient ability to realise and predict the future at this stage, it is important to encourage them to express their thoughts and ideas. Moreover, this plan not only helped children to develop their imagination and creativity, but also focused on the future of the country and the environment.

2. Plan of starting to navigate

Secondly, after the ship had been built, the navigation could start. The aim of this action plan was to furnish students with the ability of future thinking, imagination and creativity during the stage of senior high school. At this stage, students should have a better understanding of future issues and should be able to display their individual creative thinking and imagination. Thus, the plan paid more attention to topics like the future of technology and the future of society.

3. Plan for leading the navigation

The aim of this plan was to cultivate innovative leaders who also have an excellent realisation of the future in universities and colleges. It also attempted to strengthen the importance of a collaborative learning environment. Therefore, since the primary goal at this stage was to develop the ability of future thinking, the focal points were the

future of industry and the future of culture.

4. Plan for continuing the navigation

This plan was based on the significance of building students' lifelong learning ability. It entailed the provision of information and activities for students in social/community universities and lifelong educational institutions to develop their future thinking, imagination and creativity after they had graduated. At this stage, the plan reinforced students' understanding of the future of the country.

5. & 6. Plans for guidance and support

These two plans focused on the future of education and attempted to equally develop the ability of future thinking, imagination and creativity. The aim of the plan for guidance was to identify creative and talented people, but it also contained indicators and systems to guide each stage of FI. The plan for support was designed so that educators and educational organisations, such as teachers, administrators, and the Centre for Teacher Education in universities, would be able to maintain a free-flowing workable system to cultivate talented people.

Furthermore, in tandem with these action strategies, the MOE simultaneously provided an *'Action group of future imagination'* and a 'top-down' and 'bottom-up' approach. FI also included experimental courses, which involve formal curricula, to strengthen the cooperation within enterprises to connect the different stages and fields of education (MOE, 2009). Above all, FI not only focused on schools and students, but also on teaching and learning. This meant that FI would be applied at different educational stages with the aim of enhancing the creativity and imagination of students and teachers for the future. Therefore, how to foster 'creativity', 'imagination'

and ‘future thinking’ in education were the main points of the FI policy.

2.3.2 Core Competences of ‘Future Imagination’ Policy

The three core competencies contained in the ‘Future Imagination’ policy proposed by the Taiwanese Ministry of Education in 2009are briefly described below (MOE, 2009).

(1) Imagination

This is the ability to imagine things that are not real or to form a mental image of something that is not present to the senses in reality. It can involve an experience, knowledge and logics, but it can also go beyond them. The functions of imagination are to increase the interest, broaden the possibilities, or provide hope.

(2) Creativity

Creativity may relate to a characteristic, a process, an environment or a product for developing novel, appropriate, useful and valuable ideas, actions, knowledge or any kinds of products.

(3) Future Thinking

Future Thinking is the ability of humans to imagine and consider the future. It can help individuals to cross existing boundaries, attitudes or actions, and balance long-term and short-term thinking. It can also help to develop a variety of viewpoints to explore every possibility in every field in the future. Furthermore, the government or researchers could use these ideas to design or assess actions related to solving possible problems in the future.

The relationship between these three core concepts (See Figure 2.4) will be discussed in this section. Firstly, humans should be able to not only imagine the future or the present, but also different times and space. Thus, the overlap between imagination and future thinking is the most important aspect of imagining the future. Secondly, some imagination is normal or just a copy of someone else's idea. Only part of it is truly creative, and this is 'creative imagination', which constitutes the overlap between creativity and imagination. Thirdly, imagination is more focused on visions (sight) and images, but creativity could involve innovative or creative outcomes in oral language, writing, concepts, mathematical models, products, values, or the orders of an organisation. Therefore, these two concepts are not equal and the overlap between them is the ability or motivating power to create the future. Finally, the overlap of these three concepts is the main ability in this project, which can be explained by two aspects, one of which is mental or 'the creative future imagination'. The other is action, which entails imagining and creating the future. In the short, creativity and imagination are the two pillars that support future thinking.

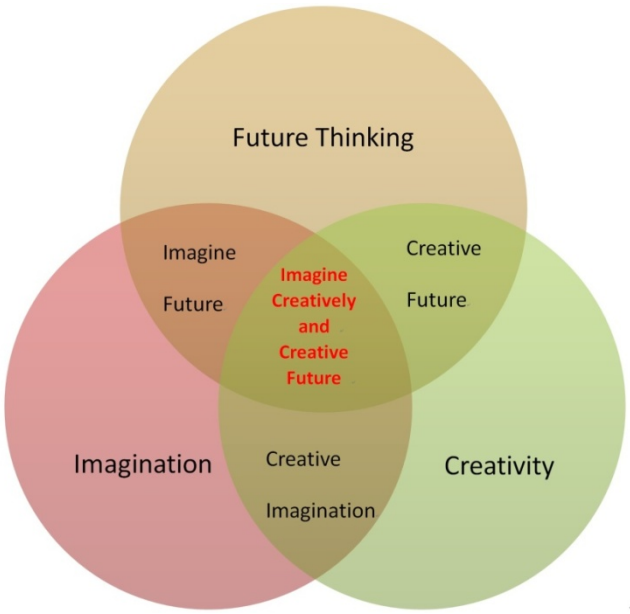

Figure 2.4 Relationship between creativity, imagination, and future thinking
Source: Ministry of Education (2013). Future Imagination Education in Taiwan. MOE: Taipei. P.38

A six action plan was designed for this project in order to develop these three core competences. The project also entailed asking the public's opinion of the six action plan and it was hoped that the proposed educational activities could practice and combine the three core competences in the teaching and curricula, but also the school climate or environment.

2.3.3 Action Plan for Building the Ship

Since the focus of this research is primary education in Taiwan, the action plan in the FI policy is 'the action plan for building the ship', which is intended for primary and junior high schools in Taiwan. As mentioned in the above section about the metaphors of 'ship' used here, the ship implies the starting point for children to explore and investigate any possible futures during this educational stage (primary to junior high schools in Taiwan). Since this is the first stage of compulsory education in Taiwan, it could be crucial for students to learn some important abilities and gain the basic knowledge of different subjects. Therefore, the aim of this action plan is to promote the ability to teach future thinking, imagination, and creativity; therefore, it emphasises the realisation of the future of the country and the environment. It is also expected to encourage schools and local education departments to develop experimental lessons of creative teaching, integrate resources from different fields, establish communities for teachers' professional development, and construct and cultivate models to develop the creativity of talented people. This action plan is related to two principal issues, namely, the future of the country and the future of the environment (MOE, 2009), both of which are described below.

1. Future of the country

Based on the existence of climate change and wars in the world, students should focus on the rebuilding and sustainable development of countries after such changes. This would enhance their ability of future thinking and imagination, so that they could use it when they meet these inevitable changes in the future.

2. Future of the environment

This action related to global warming, environmental damage, natural disasters, the extinction of species, and energy exhaustion. It was anticipated that students would consider global ecology and participate in thinking and resolving local environmental problems. This action was also aimed to encourage children to consider the kind of life and society in which they want to grow up and live, and thus develop their version of a better life and future.

Based on the target and importance of the above two issues, students participated in different kinds of activities at school and tried to resolve problems related to these issues during the period of FI implementation. On the other hand, in terms of the goals of the plan of building the ship, the actions were to emphasise the development of imagined courses or activities, organise a creative team, including school principals and teachers, and combine the theory of future education with the teaching field.

Furthermore, the MOE established an official office for the promotion of the concepts and importance of ‘future imagination’. This office accumulates creative project proposals for future education from primary and junior high schools in Taiwan, reviews them and then provides funding for those that are approved. These proposals include strategies and processes, expected outcomes and evaluations, members and budgets, and timetables of projects. These creative project proposals have three main

aims, as follows;

1. To develop students' ability to ask questions, as well as to foster their creativity, imagination and future thinking.

The aim of creative projects is to create new types of lessons or teaching activities, which can develop students' ability to ask questions, imagine problems, and resolve them.

2. To organise a creative team to foster future imagination and creative, talented people.

The school should recruit a team to organise creative conferences, as well as summer or winter camps for students.

3. To foster teachers' creativity.

Creative projects not only aim to develop the creativity and imagination of students, but also of teachers. Relevant activities or conferences should be held for teachers of primary and secondary schools.

In addition, schools could choose to apply or join the plan at any one of the three stages outlined above. The main office also needed to estimate the application of each creative proposal and announce the results of examinations. The first stage of the action began in February 2012 and ended in January 2013. Moreover, the second and third stages started in February 2013 and February 2014 respectively. Moreover, there was a mid-term investigation and a final examination at each stage (see Table 2.2). All the schools that participated in this plan were required to produce a paper report and presentation to display the outcomes.

Table 2.2. Timetable of 'building the ship' action plan

	Date of application	Date of mid-term investigation	Date of final examination
First Stage February 2012 to January 2013	15th August to 15th October 2011	Between June 2012 and August 2012	Between December 2012 and January 2013
Second Stage February 2013 to January 2014	15th August to 15thOctober 2012	Between June 2013 and August 2013	Between December 2013 and January 2014
Third Stage February 2014 to January 2015	15th August to 15th October 2013	Between June 2014 and August 2014	Between December 2014 and January 2015

In short, there were two aspects of the expected effects of building the ship action plan, one of which was to establish a group of professional teachers. This group of teachers would share and communicate their teaching documents, experience and observation when they participated in the plan. The interaction and feedback should progress the teachers' creative teaching and thinking. The other expected effect was to enhance students' creativity, imagination, systemic and critical thinking, prediction and finding of questions, and resolving of problems. Therefore, the action plan was designed to combine imagination and creativity with formal education and provide a creative climate on the campus for both students and teachers.

2.3.4 Expected results in 'Future Imagination' (FI) policy

The expected results in FI had the following five orientations;

(1) Students/Learners

The learning process was expected to provide the '3E' strategies for children, namely, "Explore", which includes imagine, create, assume, verify and solve problems and receive a deep realisation; "Experience", which entails learning by doing, such as a real learning process in different contexts; "Enjoy", which could be the desire for knowledge, the flow experience in learning, or the passion for a particular field of learning. As for the results of learning for students, FI could enhance their ability to imagine the future, adapt to changes in the future, and engage in creativity in the future.

(2) Teachers

After attending this project and designing the activities, creative teaching methods or learning tools, the intention was for teachers to enhance their understanding of creative teaching and engage more deeply in creative education using the strategies and skills acquired. Moreover, the project was intended to build groups or organisations that included creative teachers, or partnerships with different industries to provide creative training workshops for teachers and to cooperate more with cross-field industries to develop more creative teaching strategies. The final goal was that formal and informal curricula in education would be based on the three core concepts of creativity, imagination and future thinking, which children would learn throughout the education system in Taiwan. Moreover, the government would also encourage these groups or organisations to share their creative teaching experience with more teachers so that all teachers would eventually know about creative

education and have the will to engage with it in the future.

(3) Schools

During the FI project, the school climate and environment would become more creative and open for learners. In addition, the school administrators would also have a deeper understanding and appreciation of the benefits of creative education and would, then, provide more support for teachers to promote a creative teaching culture.

(4) Issues

This project would promote further discussions about the future of industry, culture, education, technology, society, the environment, and the country by different sections of the public. More people would engage with it and propose appropriate debates and strategies in order to develop a broad perspective and vision of the future.

(5) Products

Due to the different ages, occupations and professional fields of the participants in the FI project, there would be a variety of products, which may be in the form of words, media, digital platforms, games, models, or art. These products could also raise the concern of the general public and encourage them to take civil action in order to create the best future for themselves and the country.

Furthermore, the important point of future imagination is not the ‘answer’, not the ‘correct predicted result’, but the ‘posing of good questions’. This means that people can imagine the future and create the future using their creativity, imagination, systems thinking, and futures thinking (MOE, 2013).

2.4 Previous research of Future Imagination in Taiwan &findings of the Plan of Building the Ship of FI Policy

According to the database of dissertations and theses in Taiwan, there are 19 empirical studies (dissertations) that relate to the Future Imagination policy (See Table 2.3).

Table 2.3 Previous studies of future imagination in Taiwan

Author	Title	Educational Stage
Chen, Y. (2014)	The Effect of Future Imagination Career Planning Curriculum Program on the Future Imagination Disposition and Life Adjustment Ability for the High School Students	Senior High School
Chen, Y. (2012)	The curriculum design and effect evaluation of "Nurturing future imagination and creative talent" of teacher empowerment workshop - A case of high school	Senior High School
Wu, I. (2011)	Developing the Scale of Future Imagination Disposition	Senior High School
Peng, S. (2013)	The Development of Assessment Project for Future Imagination about the " Western China in 2030 "	Junior High School
Chang, H. (2013).	Development of the Assessment Project for Future Imagination in Language Arts (English) Learning Area	Junior High School
Liu, P. (2014)	The Effect of Infusing Future Imagination into Visual Arts Instructional Program on the Imagination and Drawing Performance Ability of the Elementary School Students	Primary School
Liu, Y. (2014)	On the Primary School Future Environmental Education Based on the Integration of Future Imagination with Picture Books__A Case Study	Primary School
Tsai, J. (2014).	A Case Study on Developing the Instructional Program for Future Imagination about the "Future Disasters"	Primary School
Kuo, H. (2014).	The Study of the Application of Imagination of the Future into Children's Art Learning Activities.	Primary School
Lee, M. (2013)	An Action Research on Integrating Design Thinking Model into the Instructional Program for Future Imagination：The Project of Designing the Sports Center on the riverside	Primary School
Chu, J. (2013).	An Action Research on Developing the Instructional Program for Future Imagination about "the Aodi 20 Years Later"	Primary School
Chen, Y. (2013).	Walking into the Time Tunnel to the Future: The Development of Assessment Project for Future Imagination	Primary School
Lin, M. (2013).	The Development of Assessment Project for Future Imagination on The Future Career	Primary School
Lee, W.	An Action Research on "Developing the Instruction Program for Future Imagination" about "The	Primary School

(2012).	Future Community ”	
Fang, H. (2012)	A Study of Principals’ Creative Leadership in Elementary Schools—Based on Creativity and Imagining the Future in Education: Grades 1-9 Action Plan	Primary School
Yin, H. (2011)	An Action Research on Developing the Instructional Program for Future Imagination about Future Learning Center	Primary School
Lai, M. (2011)	An Action Research on Developing the Instructional Program for Future Imagination about the “ Myself in 2030 ”	Primary School
Chiang, M. (2011)	An Action Research on Developing the Instructional Program for Future Imagination About the Hometown Ludi	Primary School
Chang, W. (2014)	Exploring Future Images of Sci-Fi Movies: Insights of Sci-Fi Fans" Future Imagination.	No Particular

Some of the 13 previous studies that focused on primary education in Taiwan produced similar results. Firstly, after the teaching activities of Future Imagination, children have more creativity and future thinking ability. Secondly, some of the researchers indicated that the enhancement of children’s learning motivation is also important to increase their imagination and creativity. Thirdly, due to the age of children in primary education, teachers may need to prepare construal teaching plans to teach future thinking in the class. This means that children at this age may need more instructions during the course to develop their creativity and imagination.

These previous studies also demonstrated that the promotion of future imagination education and creative education is still in its infancy in Taiwan and it is necessary to examine many experimental courses and teaching designs. Although Taiwanese teachers recognise the importance of future imagination education, the main problem for them is how to use this concept in their teaching. In addition, it is quite difficult to assess the concept of future imagination using the quantitative research method, since some parents and members of the public would be bound to question the effect of future imagination education (MOE, 2013).

Furthermore, it is also mentioned in the book entitled, 'Future Imagination Education in Taiwan' (MOE, 2013), that schools, teachers and students are the main targets of the first stage of the FI policy, 'the action plan of building the ship', which is based on primary education.

(1) Schools

The size of the school is also a factor that could influence the teaching of future imagination. For instance, it would be easier to design appropriate activities to promote children's future imagination in a small school or one with a specific history or particular culture. Moreover, the location of the school would also affect its ability to deliver courses on future imagination in terms of accessing resources and the children's family background. The teaching goal and content would also need to be adjusted according to the school or the children's background.

(2) Teachers

The number of teachers and their level of passion and dedication to the future imagination policy are two issues that will result in different outcomes. If teachers implement future imagination activities in formal subjects, such as the Chinese Language or Mathematics, they may need to spend more time, which will result in additional pressure. Moreover, the teachers would need to be highly focused and involved to complete the teaching on time and ensure that the children achieved the teaching goals. Therefore, the motivation and passion of the participating teachers are also important factors. Moreover, the FI policy encourages teachers in different fields to form a group so that they can cooperate when they need to implement some cross-field learning activities. Therefore, the cooperation of teachers who teach

different subjects is extremely important to the promotion of future imagination in primary schools.

(3) Students

Since there may be cognitive differences between children of different ages, the design of the curriculum and the teaching goals would need to be adjusted according to the children's ages. For example, students of higher grades in primary schools have a more abstract thinking ability and could be taught by means of analogies or logic. In short, the design of the curriculum in future imagination education should be adjustable based on the time and difficulty the teaching activities entail. Lower-grade students would need more time for their imagination to be stimulated, while higher grade students could learn more about displaying their creativity and imagination.

Teaching the skill of developing future imagination is akin to providing children with a useful tool to prepare for the future. In short, future imagination is not taught to facilitate examinations in education; rather, it entails developing different perspectives of the future and providing children with the ability to solve the problems they are likely to encounter in the future.

2.5 Conclusion

The two main policies for creative education in Taiwan in the past 20 years are illustrated in this chapter. The second one, the policy of 'Future Imagination' (FI), which began between 2011 and2013, is the focus of this research to observe the children's creativity in the stage of primary education. The main goal of the FI policy is to highlight the development of students' ability to imagine the future, create the future and adopt the future, but also to assist learners to be prepared to resolve any

problems they are likely to encounter in the future (MOE, 2013). In order to achieve this aim, the MOE (2009) provided an activity structure composed of six action plans to be undertaken at all educational levels (elementary school to adult education). My research will focus on the first stage of FI–'The action plan of building the ship' which is implemented in primary to junior high schools.

The FI policy represents a great and wonderful vision of Taiwan's creative education with its aim to develop all children's ability to be imaginative and creative in thinking about the future, which will enable them to overcome the challenges they may encounter during their lifetime. The FI policy also includes all educational levels, from children to adults, since education does not cease at a specific age. However, since the implementation of the FI policy is not compulsory, some teachers at schools that have not implemented it are still unfamiliar with FI; hence, the effect of creative education could be limited. Nevertheless, it is the good start for Taiwan to promote the importance of creative education and encourage more schools and teachers to join in these activities in the future.

The other two main issues in my study, 'PT' and teachers' pedagogy, will be discussed in the next chapter.

Chapter III

Creativity, Possibility Thinking and Creative Pedagogy

Chapter III introduces and discusses the two main topics of this research: creativity and PT and creative pedagogy. The preceding chapter indicated that many countries have started to pay more attention to the issues of creativity and imagination not only in adults, but also in children. In this chapter, I describe the main concepts of creativity before focusing on the explanation of PT. In the second part, I present another topic included in my research design—namely, teacher's pedagogy. In order to realize the relationship between children's PT and teacher's pedagogy, I present literature introducing some of the main models of creative pedagogy in previous studies. The last part describes the conceptual model used in my study to answer the research questions.

3.1. Creativity and Possibility Thinking

3.1.1Creativity

Early research on creativity conducted in the 1950s focused mainly on the psychological determinants of an individual's genius and giftedness (Craft, 2001). Three main topics emerged from the research on creativity at this time—namely, personality, cognition, and the stimulation of creativity (Craft, 2001; Eisenman, 1997; Ryhammar & Brolin, 1999). Kurtzberg and Amabile (2001) also found that creativity research addresses three general topics: the cognitive process of a creative person, the creativity personality and behavioural elements of a creative person, and the broad

environmental context supporting creative works.

It is difficult to define the term *creativity*, which presents a challenge to researchers in the field. Creativity is complex in nature, and multiple interpretations are associated with it. Each viewpoint emphasises a different aspect of creativity and uses different theories to analyse it. For example, Rhodes (1961) analysed more than 50 different definitions of creativity, dividing them into four categories: the creative person, the creative product, the creative process, and the creative environment. These categories, as described below, have been helpful in shaping my own understanding of the meaning of creativity.

The Creative Person: What kind of person is creative? By focusing on the aspects of personality-related traits and the mental ability of a person to create new things, Guilford (1950) found that creative personalities are likely to be involved in creative behaviour, such as invention, design, composing, creation, or planning. Early research on creativity from the 1950s focused on the concept of a highly creative personality (Chávez-Eakle, Lara, & Cruz-Fuentes, 2006).

The Creative Product: Creativity has also been defined in terms of products. If a product is considered to be creative, the person who made it may also be considered creative. Amabile (1987) indicated that a creative product is novel, appropriate, useful, and valuable. Csikszentmihalyi (2000) proposed that a creative product must be chosen and determined by the gatekeeper in the field; thus, a creative product should not only be original or new in the field or social context, but also useful and appropriate for the requirement of solving problems. Having satisfied these elements, a creative product needs to be accepted by experts in the field.

The Creative Process: The target of a process-oriented approach is realising how the thinking process works to produce creative products. Davis (1986) asserted that creativity occurs in the thinking process of someone who wants to resolve a problem. If the creative process of thinking is found and understood, researchers and educators can aim to develop such thinking skills among children. Therefore, the question of how to foster creativity arises. Wallas (1926) proposed four steps to creative thinking: preparation (gathering information about a problem), incubation (developing solutions or ideas), illumination (the emergence of solutions or ideas), and verification (examining solutions or ideas). From this perspective, creativity is the creative thinking process used to resolve problems.

The Creative Place: Researchers have paid more attention to the influence of interactions between people and the environment since the 1980s. They have also emphasised the importance of a creative climate (Hunter, Bedell, & Mumford, 2007). Amabile (1997) claimed that people's instinctive motivation, behaviour, and creativity are significantly influenced by their different social or working environments. In addition, Simonton (1998) proposed 'The Environment Impact Perspective' which focuses on the importance of interaction between the environment and people's creations. Therefore, particular social or historical contexts are influential elements for the development of creativity. Moreover, creativity can be viewed as an outcome of the cultural or social environment (Csikszentmihalyi, 1988). In short, 'place' can not only enhance the creative performance, but also motivate a person to create.

In contrast with the discussed definition and earlier development, understanding how creativity is linked to the social context has a number of implications in terms of

education. Some scholars such as Csikszentmihalyi (1996, 1998, 2000), Amabile (1983, 1996), and Sternberg and Lubart (1991) have advocated the study of creativity in a social context. They believe that, regardless of whether creativity is considered to be a process or an outcome, it is ultimately linked to social processes and contexts. Csikszentmihalyi (1999) advocated the study of creativity in a social context and proposed the 'Systems Model of Creativity'. He claimed that creativity can be best understood as a confluence of three factors: the *domain*, which includes a set of rules and practices; an *individual*, who makes a novel variation of the contents of the domain; and the *field*, which is held by gatekeepers, such as experts and scholars.

In addition, Amabile (1983, 1988, 1996) offered a 'componential' model of creativity (See Figure 3.1), comprising three major components that can contribute to creativity: expertise (domain-relevant skills), creativity skills, and task motivation. This framework suggests that even very minor aspects of the social environment can influence individuals' creativity.

Figure 3.1The componential model of creativity

Source: Amabile (1996). *Creativity in context: Update to "The Social Psychology of Creativity"*, p.84.

On the other hand, Csikszentmihalyi and Wolfe (2000) advocated the application of a systems model for creativity in education and proposed that schooling includes the dimensions of students (individuals), material or curriculum (domain), and teachers (the field).The interaction of these three elements influences the production of creativity (see Figure 3.2). Whether or not schools and teachers are providing these elements to children can be examined, and their level of interaction in the programmes or courses can be determined when examining or promoting creativity in education.

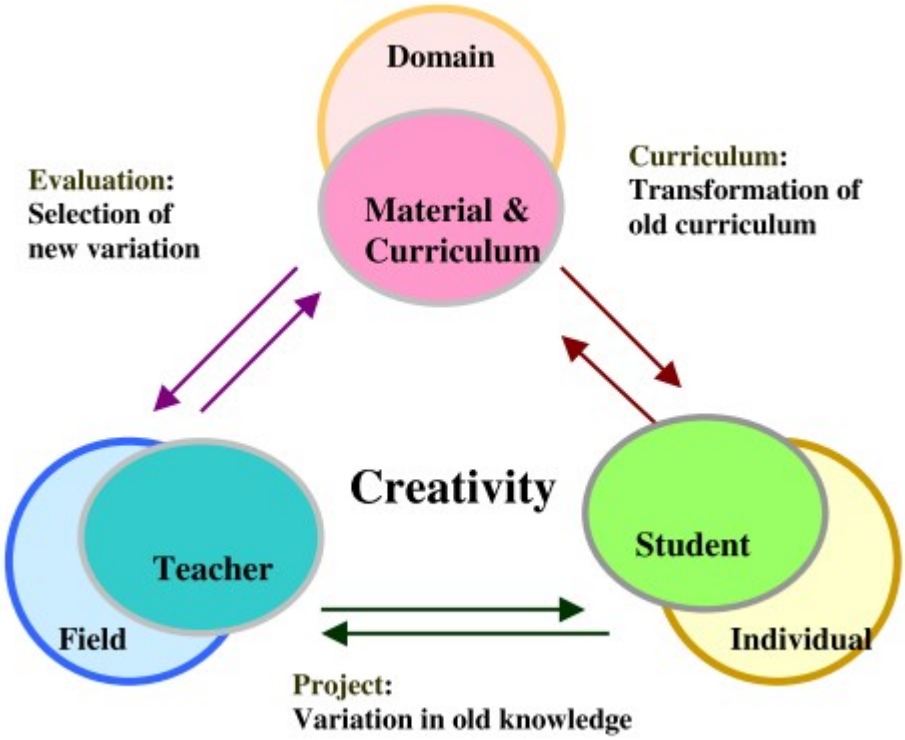

Figure 3.2 Systems Perspective for Creativity in Education

Source: Csikszentmihalyi& Wolfe (2000). New conceptions and research approach to creativity: Implications of a systems perspective for Creativity in Education. In Heller, Monk, Sternberg, & Subotnik (Eds.), *International Handbook of Giftedness and Talent* (p.84).

Csikszentmihalyi (1996) presented this system model of creativity and provided the recognition and value of creativity, which are related to domains, fields, and individuals. The 'field' in this model is a component of creativity while the other element of 'individual' acts as a gatekeeper, meaning it would be the key man for recognising, preserving, and remembering creative outcomes (Csikszentmihalyi, 1996). Moreover, 'creativity is the interaction between a person's thoughts and actions, their knowledge and skills within a domain and sociocultural context which can encourage, evaluate and reward' (Avril, 2015, p.137). The concept of the system model can be applied in my study because it mentions that creativity and learning should exist in the wider context, such as schools, classrooms or educational systems, and even society, and it would interact with the people, field, and environment. Therefore, 'there can be a tension, however, between the current policy of promoting creativity in education that can be linked to political and economic imperatives, and the place of creative people and communities who can be challenging and disruptive to the status quo' (Avril, 2015, p.137). Thus, my study uses three cases: two under the creative policy (FI) and one school which did not join the FI. I also aim to observethe gatekeepers in the field (i.e., teachers in the classrooms)to identify interactions among the creativity in children (individuals), teachers (fields), and environment (domain) in Taiwan's primary education. I will also focus on the relationship between the children's creativity (PT) and teacher's pedagogy under Taiwan's FI policy.

3.1.2Development of Possibility Thinking in Creative Education

The UK's National Advisory Committee on Creative and Cultural Education (NACCCE) issued a report entitled 'All our futures: Creativity, Culture and Education' (NACCE, 1999). At that time this reforming document placed creativity at the heart of

the curriculum and paved the way for schools to form partnerships with theatres, museums, galleries, orchestras, and other cultural organisations in their communities and beyond.

In 2002, the Arts Council England and the Department for Culture, Media and Sport (DCMS) introduced a Creative Partnership (CP), the government's flagship creative learning programme. This policy was funded by the DCMS and DfEs (Department of Education and Skills), and the total funding from 2002 to 2008 was about £161 million (Parker, 2006). The core belief of the CP was that creative learning and teaching can be performed through various activities across the curriculum. The CP report (2008) states that the CP had already reached more than 1,100,000 individuals, from children to teachers and creative practitioners in more than 12,800 schools in 36 different areas across England. In addition, because of its success, the Arts Council England declared that the CP would be operated by Creativity, Culture, and Education (CCE), and would receive more than £75 million in funding from 2009 to 2011.

Moreover, the Qualifications and Curriculum Authority (QCA) developed a policy framework for creativity and designed a four-year devolvement and research project with the aim of enabling teachers to promote and develop children's creativity in classrooms (QCA, 2005). The QCA conceptual framework also involves both the process and outcome of children's creative engagement and reflects the finding that creative engagement is seen to include open adventures, enabling children to explore and develop knowledge through productive engagement with their work (Jeffery and Craft, 2004; Cremin et al., 2006). However, on the whole, relevant studies of creative education undertaken in England have often focused on exploring a particular discipline rather than searching to understand creativity across a variety of domains,

and few have focused on ‘finding’ and ‘promoting’ creativity across the curriculum (QCA, 2005; Cremin et al., 2006).

In order to conceptualise and develop a common understanding of genuine creativity in both learning and pedagogy, the curricula for schools and colleges focus on skills such as learning to learn, communication, critical thinking and problem-solving, ICT, information handling, literacy and numeracy (Burnard et al., 2006; Craft et al., 2008).

Kaufman and Beghetto (2009) presented the Four C model of creativity. This model includes ‘mini-c creativity’, ‘little-c creativity’, ‘pro-c creativity’ and ‘big-c creativity’. Mini-c creativity refers to ‘the dynamic, interpretive process of constructing personal knowledge and understand within a particular sociocultural context’ (Kaufman & Beghetto, 2009, p.3) as measured by self-assessment (Craft &Chappell, 2014; Hui, He, Liu-Au, &Ching, 2015). Little-c creativity involves personal meaning making for everyday creativity and is more often associated with young children because it includes not only the end product, but also the processes of using their imagination or creativity in making products (Craft, 2001; Csikszentmihalyi, 1996). Cheung (2016) concluded that it is ‘the mental processes involved in problem-solving and the generation of ideas’ (p.143).Meanwhile, Kaufman and Kaufman (2007)defined pro-c creativity as ‘representing the developmental and effortful progression to attain professional-level expertise in any creative area’ (Hui et al., 2015, p.213). Finally, big-c creativity is eminent creativity (Simonton, 1991); it also means ‘the continuum representing high impact and high originality which is what Boden calls “H” creativity or “historical” creativity that changes the world, or transforms paradigms’ (Craft &Chappell, 2014, p.2).

Researchers have also distinguished between two kinds of creativity: 'big c' and 'little c' (Craft, 2000, 2001). Big-c creativity represents the extraordinary or genius creativity that makes a remarkable impact or achievement in society (Craft, 2001; Csikszentmihalyi, 1996) whereas little-c creativity focuses on everyone's potential to be creative and engage in everyday problem-solving as it relates to the everyday creativity that occurs in daily life (Craft, 2000, 2001). Although the influence and impact of little-c creativity are less than those of big-c creativity, little-c creativity is still considered a necessary skill for coping with extreme changes and difficulties in a variety of aspects of life in the 21stcentury (Craft, 2005). Therefore, in my study, I aim to observe how children show their little-c creativity during the learning activities. In addition, little-c creativity could involve personal meaning making for everyday creativity and it could occur in problem-solving in children's' daily lives or in classes. Although it is not the extraordinary or genius creativity of big-c creativity, it still presents the important process for children to use their imagination or creativity for finishing the work, meeting difficulty challenges, and generating ideas during learning. I also believe that little-c creativity could be more encouraged in children's learning because these little creative ideas might be developed into big-c creativity in the unknown future. Therefore, as Craft (2001, 2002) posed that PT can be construed as being the engine of everyday or little-c creativity, which involves a shift in relation to identifying, honing, and resolving problems (Jeffery & Craft, 2004). I chose it as my main research topic in order to study children's little-c creativity in Taiwan's primary education. The following sections provide more details on literature related to PT.

According to the research literature, PT provides a means whereby questions are posed or puzzles surfaced (Craft, 2002). Craft (2000, 2001; Cremin et al., 2006) argued that PT is implicit in children's engagement with problems and suggested that

it is exemplified by posing the question ‘what if?’ in multiple ways. This involves a shift from asking ‘What is this and what does it do?’ to ‘What can I do with this?’, particularly in relation to identifying, honing, and resolving problems (Chappell et al., 2008; Craft, 2000, 2001; Jeffrey, 2005; Jeffrey & Craft, 2004).Craft, McConnon, and Matthews (2012) also indicated that children will make the transition from ‘what is this?’ to ‘what can I or we do with this?’ and imagine that they were in a different role by using PT. This is because the relationship between teachers’ intervention and children’s self-determination can explore the different possible answers to questions during children’s learning (Chappell et al., 2008). In addition, Joiner et al. (2000) stated that ‘question-posing’, ‘posing questions’, and ‘questioning’ refer to interactive perspectives, practices, and products which define children–children and children–teachers interactions and collaborations, which may drive the features of PT. Therefore, the importance of children’s questioning skills in PT will be emphasized in my research.

PT generates a new understanding and theoretical development of the type of ‘what’ and ‘how’ questions seen as an important first step in helping teachers interpret children’s creative learning (Burnard et al., 2006).Moreover, PT can be understood from the three perspectives of people or agents, processes, and domains, and it includes both problem-finding and problem-solving (Cremin et al., 2006). Therefore, Craft (2002) identified eight necessary features that may be clustered into two over lapping concepts—namely, process and outcome (see Figure 3.3) (Burnard et al., 2006).

Figure 3.3.Theoretical concepts of possibility thinking

Source: Burnard et al. (2006). Documenting 'Possibility Thinking': a journey of collaborative enquiry. *International Journal of Early Years Education, 14*(3), 245.

Based on these theoretical concepts, empirical work on PT has been undertaken in three early-years settings since 2002. In Stage 1, the PT project team tried to identify and document the factors that characterised PT in creativity for children in early years (3- to 7-year-olds). PT projects included two head teachers, two teachers, and a teaching assistant, along with three core university-based researchers and three additional researchers (Burnard et al., 2006). The study was carried out in three early-years settings, using naturalistic collaborative enquiry as the methodological approach.

In addition, this study adopted a deductive–inductive analytical approach in order to ground and support emerging theories. Firstly, the research team worked deductively by linking an existing conceptual framework or set of characteristics of creativity in education to a UK QCA framework. This involves:

- Posing questions;
- Making connections;
- Being imaginative;

- Exploring options; and
- Engaging in critical reflection/evaluation (QCA, 2005)

On the other hand, the researchers worked inductively by re-examining the data to document and identify emergent categories and relationships (Burnard et al., 2006; Craft et al., 2007). The study in Stage 1 used the following data collection methods: video-stimulated reviews (QCAs and additional material collected specifically for this project), participant and non-participant observations, and interviews. It included three phases.

The first phase of study used VSR and an analysis of the QCA video material to organise the PT documentation framework by using the PT conceptual framework (three-fold structure) and the QCA Creativity Framework (see Table 3.1). In phase 2, the research team began to interview and engage in informal conversations with teachers while also collecting extensive classroom observations in each setting. In total, 15 hours of classroom observations and nine hours of informal conversations were gathered, along with documents of children's work, photographs, and curriculum guidelines in each setting. In the last phase, the research team clarified, tested, and triangulated the research findings. In addition, the teachers and researchers worked with each other and had half-day data strategies/research meetings.

Table 3.1 Possibility thinking documentation framework

	Evidence of learning	Evidence of pedagogy
Process		
1.1 Posing questions		
1.2 Play		
1.3 Making connections		
Outcomes		
2.1 Self-determination		
2.2 Action/intention		
2.3 Development		
Outcomes and Process		
3.1 Innovation		
3.2 Being imaginative		
3.3 Risk taking		

Moreover, the findings of Stage 1 identified a number of differently interlinked features of children's and teachers' engagement with PT in the context of an enabling environment (Burnard et al., 2006; Chappell et al., 2008; Cremin et al., 2006). After completing Stage 1 of the PT studies, the researchers developed a model of PT.A new diagrammatic representation was created (see Figure 3.4) which more accurately reflected the integration of creative teaching and learning and could further foster the development of PT. This model included posing questions, playing, immersion, innovation, being imaginative, self-determination, and risk-taking. In addition, the previous study identified the core PT features of children's and teachers' engagement which are valued and fostered in the context of an enabling environment (Craft, Cremin, Burnard, &Cappell, 2007b, p.4). These seven elements of PT, which were evident in all the classrooms, are discussed below.

Posing Questions

Posing questions focused on both audible and inaudible factors. Children's questions

were treated with interest and respect and were documented through the classroom observations of behaviour and a deep knowledge of each individual. The process included children's verbal and non-verbal questions, typically made visible through a playful 'as if' activity(Craft &Chappell, 2014, p.2).In addition, posing the questions in an 'as if' space was demonstrated by children making connections through prediction, compensation, improvisation, and testing (Burnard et al., 2006, p.255).

Play and Immersion

In the PT feature of play, children were offered opportunities to develop and combine their ideas in their play. They were often highly motivated by their interest and happily engaged in learning. Moreover, a high level of engagement in learning activities and playfulness enhanced their imagination and helped them resolve diverse problems (Burnard et al., 2006). In the studies, children were often highly engaged, very serious in their playfulness, engaged closely with one another, imagining many scenes, and encountering and solving diverse problems(Craft et al., 2007a, p.4)while also extending exploration and generating diverse ideas(Craft &Chappell, 2014, p.2).
For the immersion feature, the studies showed that the children were deeply immersed in an open and friendly environment in each learning context providing a caring, positive, and benign environment while combining high emotional support with high cognitive challenges (Burnard et al., 2006; Craft et al., 2007a; Craft & Chappell, 2014).

Innovation and Being Imaginative

In the innovation feature, the children made strong and playful connections between ideas triggered, scaffolded, and extended by thoughtful adult provocations (Craft &

Chappell, 2014, p.2). In order to observe the changes in the children's thinking, the teachers and researcher worked with them closely and explored their growing understanding while offering well-chosen support to stimulate the children's connection-making (Burnard et al., 2006; Craft et al., 2007a).

On the other hand, the being imaginative feature in PT means that the children engage in an extended imagination of what might be, often designing and inventing (Craft & Chappell, 2014). They invented many imaginary worlds in which they could engage and postulated the reason for their worlds. In addition, being imaginative helped them play a role as decision-makers so that they could determine the feasibility of ideas, define the content of learning tasks, and find a way to approach these ideas and tasks(Burnard et al., 2006; Craft et al., 2007a).

Self-determination and Risk-taking

In an open and safe environment, children appeared to grow in confidence and tried to develop ownership of the learning context. They also expected to make independent decisions and provide valuable contributions. Therefore, the children clearly developed the courage to take risks or do something they have never tried before. In addition, the workspace was very safe, secure, and supportive for them, so they were able to have the confidence to move to the original and creative space (Burnard et al., 2006; Craft et al., 2007a).

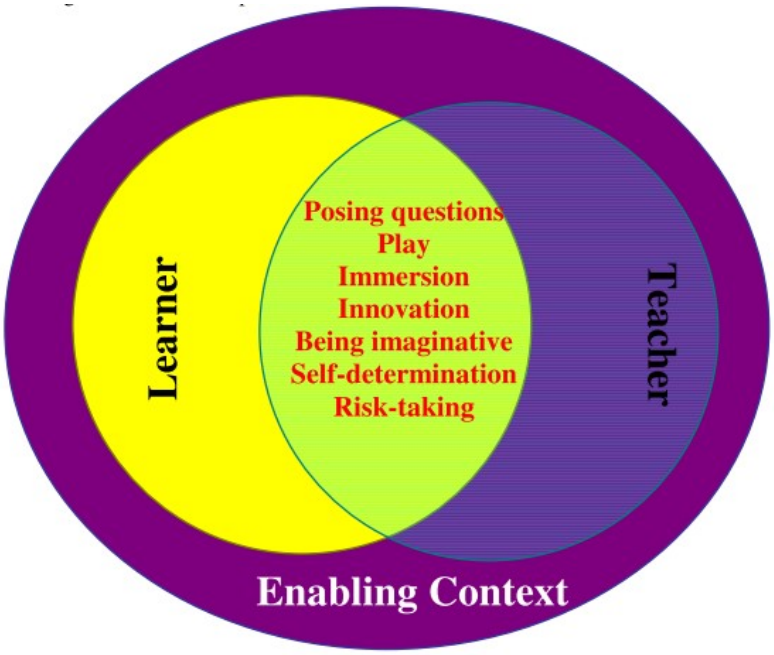

Figure 3.4. An evidence-based model of possibility thinking

Source: Burnard et al. (2006). Documenting 'Possibility Thinking': a journey of collaborative enquiry. *International Journal of Early Year Education, 14*(3), p.257.

Cremin et al. (2006) also created a PT pedagogy model to support children's purposeful engagement in creative learning. The pedagogy of PT is invisible in the classroom context, which means that teachers promote learning through children's self-chosen activities and interests, positioning themselves off centre stage. This kind of pedagogy could also foster children's autonomy and volition and often leads to innovation. Furthermore, a playful learning space or classroom context would be an enabling factor for fostering PT. Therefore, there are three important pedagogic themes in the evolution of PT: standing back, profiling children's agency and creating time and space (Cremin et al., 2006). Figure 3.5shows the relationship between PT and its pedagogy.

Figure 3.5 Stage 1 model of pedagogy and PT (Cremin et al., 2006).

Source: Craft et al. (2012). Possibility thinking: culminated studies of an evidence-based concept driving creativity? *Education 3-13: International Journal of Primary, Elementary and Early Years Education*, 540.

This stage is also considered the dimension of question-posing (Q-P) and the categories of question-responding (Q-R) as well as their interrelationship within PT. As shown in Figure3.5, the taxonomy of Q-P and Q-R exists within the PT context. Three dimensions of questioning were identified as being characteristic of PT. (1) Question framing reflects the purpose inherent within the questions for adults and children. There were three main types of question-posing: leading questions, service questions, and follow-through question. (2) Question degree or the manifestation of the degree of possibility is inherent in children's questions, including narrow possibility, moderate possibility, and broad possibility. (3) Question modality or the manifestation of the modality is inherent in children's questions. These dimensions of PT in creativity relate to not only verbal, but also non-verbal behaviour. In addition,

Q-P has emerged as the dominant feature driving the PT process under scrutiny, with Q-R being its related counterpart (Chappell et al., 2008). Nine types of Q-R might be stimulated in no particular configuration in the lower circle.

The findings of the second stage offered insights into how children engage in PT to meet their specific needs when responding to creative tasks and activities; they revealed the crucial roles played by Q-P and Q-R in the process of creative learning. The results also highlighted the contribution of verbal and non-verbal behaviours as dimensions of PT in creativity and the significance of providing more, and appropriate, time/space/responsibility/freedom for children to make their learning visible. However, there was one key concept of PT not evidenced in this stage: risk-taking.

After Stages 1 and 2 focusing on the PT in early years, the research team explored how the process or pedagogy of PT might or might not be found in older children in primary school (Craft et al., 2012). In order to understand which kind of pattern of PT would occur in older children, the research team began the third stage of the empirical study of PT in the UK's primary schools in 2012.

Participants in Stage 3 were primary school children 9 to 11 years old. Two primary schools (total of three classes) participated in this project in England. Mirroring Stage 1, the third stage also used a collaborative, naturalistic qualitative approach, and the main goal was to investigate 'What characterizes PT as manifested in the learning engagement of children 9 to 11 years old in the classroom setting, together with the pedagogy associated with it?' This research not only intended to identify and compare commonalities and differences of two PT dimensions (Q-P and Q-R), but also focused

on clarifying and manifesting how strongly the remaining six PT categories (playing, immersion, innovation, being imaginative, self-determination, and risk-taking) were across the two schools.

The research design and methodology of Stage 3 used multiple-case study and purposive sampling based on two criteria: schools with a distinctive reputation for outstanding creative teaching and learning and teachers who were recognised as creative professionals and encouraged collaboration among children in their teaching. The main methods of data collection used in this study were non-participant video observation. In total, 24 hours of video data for 12 lessons in mathematics, English, geography, science and art were observed in each school. The data from interviews with teachers and children's documents were also examined.

After collecting and reducing the data, the research team selected four episodes in two schools: two science, one maths, and one art activities. Five researchers analysed the data using an inductive–deductive process. For the data analysis processes, two researchers coded two of four episodes and then took these key codes to analyse an additional four videos. Each video sequence was coded individually. In the third step, the researchers re-coded the two sampled videos in order to obtain more codes. To ensure the validly of the coding system, three independent researchers coded all the videos again in the final step.

According to the results in Stage 3, the features were interpreted in relation to degrees of strong, medium, and weak evidence strength (see Table 3.2). Five PT features were consistently found to be strong (Q-P, Q-R, self-determination, intentional action, and development) while one feature (risk-taking) showed the least evidence, the same

result as in Stage 2. Moreover, one new feature was identified in Stage 3: collaboration.

Table 3.2Range of PT evidence across the sites of UK study in stage 3

Features	Site: South West	Site: East Anglia
Q-P	Strong	Strong
Q-R	Strong	Strong
Self-determination	Strong	Strong
Intentional action	Strong	Strong
Development	Strong	Strong
Being imaginative	Strong	Medium
Play/playfulness	Strong	Medium
Immersion	Medium /Strong	Medium /Strong
Innovation	Medium	Medium
Risk-taking	Absent	Absent

The findings also indicated the importance of service questions in primary school-aged children. Service questions during these episodes could enable an already-defined job to be done while also supporting the necessary thinking for children to develop a response or answer to the task. Therefore, the questionings of verbal and non-verbal were evidenced in three episodes but the absence of non-verbal questioning was found in only one activity which might reflect the degree of conceptual and practical engagement inherent in the domain and activity (Craft et al., 2012, p.548).

In the discussion of Q-R of all data, both accepting and rejecting Q-R types were evidenced and expressed verbally and non-verbally. This might show the means that these two processes might be core components of Q-R (Craft et al., 2012). However, this finding is similar to the results of previous research, although the utterances and

gestures evident in these episodes in primary school children differed. Because each learning activity in this research was designed by a very clear boundary by the teachers, it might narrow the possibility for children.

Furthermore, the factors which might influence the strength of PT could be school pressures (from final assessment for children in primary final year), the playful context of the activity, and the teacher's control. For example, the episodes in the South West School provided more highly playful contexts for children than those in the East West School. Therefore, the data showed that being imaginative and play features were strong in the South West School. In addition, the reason for the absence of risk-taking might reflect the teacher's control over the nature of the task; children might complete their creative work on the teacher's terms or follow the teacher's agenda (Craft et al., 2012). On the other hand, because of the absence of risk-taking in both Stages 2 and 3, future research could reconsider whether risk-taking is actually necessary to PT.

Based on the commonalities and new finding in Stage 3, one new feature emerged: collaboration. Craft et al. (2012, p.551) defined the occurrence of PT as building ideas together rather than individuals working in relation to one another. More recent PT research has emphasised the importance of collaboration among children (Craft et al., 2011; Clack, 2011), and the new model of PT in 9- to 11-year-olds also has the new feature of collaboration while including enabling tasks and associated pedagogy (see Figure 3.6). Therefore, peer collaboration may receive more attention from practitioners keen to nurture children's creativity in this key phase of childhood (Craft et al., 2012, p.551). Moreover, 'play' has been moved into 'process-outcome' in Stage 3.However, the risk-taking feature is absent from Stage 3, similar to Stage 2.

Figure 3.6 PT in 9- to 11-year-olds (Stage 3).

Source: Craft et al. (2012). Possibility thinking: culminated studies of an evidence-based concept driving creativity? *Education 3-13: International Journal of Primary, Elementary and Early Years Education*, 553.

In conclusion, PT can help teachers interpret the requisite tools for children's creative learning and provide an understanding of how creativity manifests itself in learning opportunities across educational settings (Burnard et al., 2006). Therefore, PT may acquire momentous information about ways in which classroom activities can be facilitated, such as question-posing and creative learning.

3.2 Creative Pedagogy and the Pedagogy of Possibility Thinking

In recent years, creativity has been identified as a key education goal and essential skill for 21st century that should be supported in schools (Chan &Yeun, 2014; Donovan, Green, & Mason, 2014; Richardson & Mishra, 2018). 'Forming an understanding of children's creativity is fundamental for teachers, parents, and educational authorities who wish to provide optimal conditions for its development

(Kupers et al., 2019, p.94).'In order to explore ways to enhance children's creativity, there have been many studies across different fields, different ages and in different countries. Research has not only focused on creativity in children, but also on the impact of teacher's pedagogy and environment on the development of creativity.

For example, Jia et al. (2017) indicated that mixed teaching methods that included both lecture-based and inquired-based teaching was superior to teaching approaches which is only use one approach. It could also show the strongest improvements in students' flexibility and originality on creative problem finding. In addition, Soh (2017) argued that teacher's teaching behaviours play a critical role in fostering student creativity. The impact of learning environment or climate is also stressed in the studies of creativity. Chan & Yuen (2014), for example, indicated that it is essential to investigate the ways teachers can create environments that support creativity in education. Because when the teachers believe that the creativity is important to students, they may change the pedagogical strategies for fostering student's creativity. Richardson and Mishra (2018) reported on the creation of an instrument for educators to support in the design of learning environments, used the SCALE three areas which are learner engagement, physical environment, and learning climate, in order to enhance student's creativity.

Moreover, Kupers et al. (2019) used a three-dimensional taxonomy to integrate recent empirical studies on children's creativity (2006-2017, 184 studies) and tried to understand how children's creativity is defined and measured in the field. The results showed that creativity is most often measured as a static, aggregated construct and suggested the future research should be focused on the moment-to-moment interactions that form the basis of long-term creative development. Besides, Runco

and Beghetto (2019) introduced a model of Primary and Secondary Creativity as an integrative model which can serve as a bridge between the individual and the social divide. This model also illustrated 'how the social influences the individual and the individual influences the social in both primary and secondary creative outcomes (Runco & Beghetto, 2019, p.8).

Therefore, the teacher's pedagogy, learning environment, and social influence have varying impact on children's creativity in the educational settings. My thesis also focused on the relationship between teacher's pedagogy and children's PT.

This section considers research undertaken on the pedagogical strategies that could facilitate the development of creativity in the educational context. The concept of creative teaching as well as teachers' creative actions has been the subject of various studies (Besancon & Lubart, 2008; Craft, 2005; Jeffrey, 2006; Sawyer, 2004, 2006), and many researchers have focused on the teacher, the classroom context, or the teaching content, although some have paid attention to both teachers and children. According to Watkins and Mortimore (1999, pp.3–8), pedagogical research consists of four aspects: a focus on different types of teachers, a focus on the context of teaching, a focus on teaching and children, and complex models that provide an integrated concept of pedagogy. The relationship between the teacher, the classroom context, and the perspective of learning are described in this research.

The 'Signature Pedagogies project situated in England and Founded by Creativity, Culture and Education (CCE), following the CP policy (2003-2011)' focused on the significance of story-making in nursery and primary schools. It found that 'every child is essential to a collective performance and is capable of having ideas and can

contribute to the discussion' (Cremin, 2015, p. 357). This proves the importance of the child in creative pedagogies. In addition, the National Advisory Group on Creative and Cultural Education (NACCE, 1999) maintained that all children have both creative potential and capability and that the role of education in schools cannot be limited to the transfer of knowledge and skills. Therefore, schools and teachers need to enable children to learn by themselves and adapt previously acquired knowledge to new situations while also being courageous when confronted by the unexpected. This report also noted that teaching creatively and teaching for creativity are key components in fostering children's creativity.

Moreover, Amabile (1996) stated that certain teaching strategies can improve children's creative behaviour and performance. In terms of 21st-century children, Harris and Lemon (2012, p.426) conducted research in Australia and found that creative approaches to learning are applicable to almost everyone in different contexts. Meanwhile, Dezuanni and Jetnikoff (2011, p.265) described creative pedagogies as the 'imaginative and innovative arrangement of curricula and teaching strategies for young people in school classroom'. Thus, creative pedagogy and the pedagogy of PT are discussed next.

3.2.1 Creative Pedagogy

The framework of creative pedagogy proposed by Lin (2011) is particularly pertinent to this study because it illustrates the relationship between creativity and pedagogical practices from three perspectives: creative learning, creative teaching, and teaching for creativity (see Figure 3.7). Moreover, this framework not only focuses on enhancing creativity through teaching and creative learning, which has been overlooked in the past, but also offers a different aspect—namely, teaching for

creativity. Consequently, this study demonstrates that this framework can also be developed and applied in the classroom in the Asian context (Lin, 2011). The three elements of this model of creative pedagogy are discussed below.

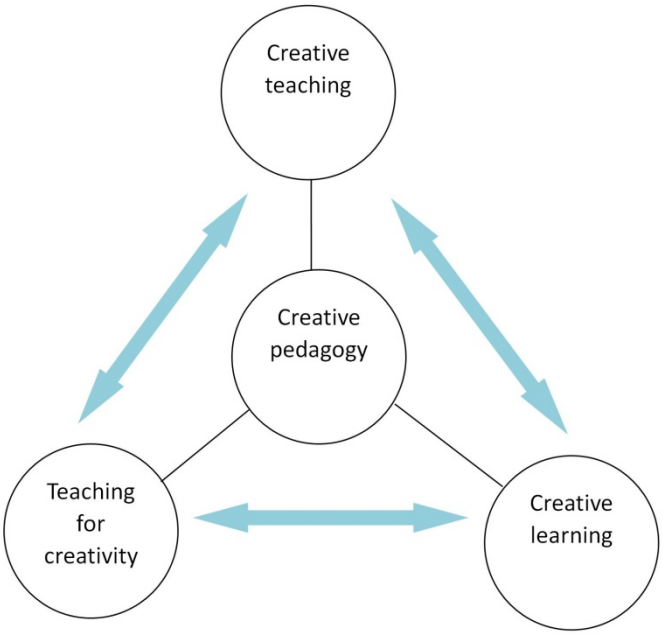

Figure 3.7.The three elements of creative pedagogy (Lin, 2011, p.152).

1. Creative learning

According to Lin (2011), creative learning is considered a salient feature of creative pedagogy. It focuses on children's actions and includes children's intrinsic curiosity in teaching activities (Lin, 2011; Toivanen, Halkilahti, & Ruismäki, 2013). Children's creative and autonomous engagement is also the focus of creative learning. Jeffrey (2006) suggested that the focus of creative learning is the process of learning itself, whereas Craft (2005) argued that the concepts of learning and creative learning are very different. Moreover, based on NACCE's (1999) definition, creative learning has three main elements: (1) it acknowledges the engagement of imagination; (2) it focuses on the production of an outcome, which may be a product or an idea that could come from individual engagement or collaborative activities; and (3) it identifies the need for the product or idea to be judged as original and valued by

appropriate observers (Craft et al., 2007b). Meanwhile, the following definition is provided by Spendlove, Wyse, Craft, and Hallgratenin 2005 as follows: ‘creative learning develops our capacity for imaginative activity, leading to outcomes which are judged by appropriate observes to be original and of value.’

(Cremin, Burnard and Chappell, 2007b, p. 137)

Since as the definition of creative learning is based on children’s actions, previous researchers have also found that PT plays an essential role and is at the heart of creative learning (Craft, 2001, 2005; Craft et al., 2007a; Jeffrey & Craft, 2006).

2. Creative teaching

This perspective emphasises teachers’ actions or practice (Craft, 2005). NACCE (1999) defined creative teaching as ‘using imaginative approaches to make learning more interesting and effective’ (p.89). Moreover, according to Sawyer (2004, 2006), creative teachers are capable of improvising and using a variety of techniques to enhance children’s creativity during their teaching activities. Cremin (2015) mentioned that creative teaching involves teachers in making learning more interesting and effective by using imaginative approaches in the classroom. Jeffrey and Craft (2004) and Lin (2011) observed that the feature of creative teaching is a creative, imaginative, dynamic, and innovative approach. For example, a teacher may design a teaching plan for the lesson in the usual way, but a creative teacher would be more flexible and could modify the plan by using the ideas raised by the children during the lesson (Sawyer, 2004, 2006; Toivanen et al., 2013). However, although creative teaching may not necessarily lead to children’s creativity, it provides both teachers and children with an appropriate context in which to be creative (Craft, 2005; Jeffrey, 2006). Therefore, creative teachers use pedagogical strategies, such as projecting their enthusiasm, imagination, and other talents, to encourage children’s

creativity (Lin, 2011; Lucas, 2001). In short, creative teaching is based on the teacher's actions as well as the formation of a dialogic and improvisational process with creative inspiration during the lesson.

Recent studies have also revealed that the features of creative learning, which include playfulness, collaboration, the development of PT, and a supportive and resourceful context, focus not only on children's actions, but also the interplay between the creative actions of teachers and children (Lin, 2009, 2011). Sawyer (2011, p.15) indicated that 'creative learning is more likely to occur when the rigid division between teacher and student is somewhat relaxed, creating an environment where teachers and students jointly construct the improvisational flow of the classroom.' The importance of the learning environment is discussed in the next section.

3. Teaching for creativity

According to NACCE (1999), the term 'teaching for creativity' has the following principles:

1. Encourages young people to believe in their creative identity;
2. Identifies young people's creative abilities; and
3. Fosters creativity by developing some of the common capacities and sensitivities of creativity, such as curiosity, recognising and becoming more knowledgeable about the creative processes that help foster creativity development, and providing opportunities to be creative in a hands-on approach. (Jeffrey &Craft, 2004, p.82)

Craft (2005) proposed that teaching for creativity highlights children's agency; Lin (2011) considered it significant for a creativity-supporting environment. Moreover, Fryer (1996) suggested that the two essential principles of teaching for creativity are

creating a learning context for problem-solving and appreciating learners' creative contributions. The atmosphere created by the teacher in the classroom is open-minded; this is the key element of creativity, which can also support and inspire learning (Toivanen et al., 2013).

The pedagogy of teaching for creativity could be described as a child-centred approach (Toivanen et al., 2013) with the aim of fostering creative learning and developing a creative person (Craft, 2005). It also facilitates children's agency and engagement by means of teaching strategies, such as learning to learn, exploring new things, or pursuing creativity (Cropley, 1992; Lin, 2011). Cremin (2015) posed that teaching creativity, in contrast to creative teaching, involves teachers in identifying children's creative strengths and fostering their creativity. The purpose of using these strategies is to arouse children's curiosity and enhance their motivation to learn.

Furthermore, Craft (2005) asserted that teaching for creativity encourages children to ask questions, argue or discuss their ideas, and actively engage in their own learning. Cremin et al. (2006) identified three pedagogical principles to enhance children's PT: standing back, profiling children's agency, and creating time and space. These principles could also refer to the significance of teachers' ability to create a supportive environment with effective strategies in order to encourage children to ask questions and become actively engaged in learning. Pedagogy to foster children's PT will be discussed in detail in a later section (Page96).

In terms of the interaction among these three elements of creative pedagogy, Lin (2011) emphasised that they apply to both teachers and children in an effective teaching and learning process. Because they also contribute to and interact with each

other, they are indispensable.

Cheung's (2016) pedagogical framework for creative practice (PFCP; see Figure 3.8) can be used to explore the way in which Chinese teachers use the Western view of a creative pedagogy in their teaching. This framework is based on the creative process model proposed by Zeng, Proctor, and Salendy (2011) and the importance of a supportive environment. It focuses on both children and teachers in the educational context. It also contains some perspectives of Western creative pedagogies, which previous studies proposed are important for the development of creativity. The PFCP contains five features derived from a combination of the concepts put forth by different scholars (Cheung, 2016).

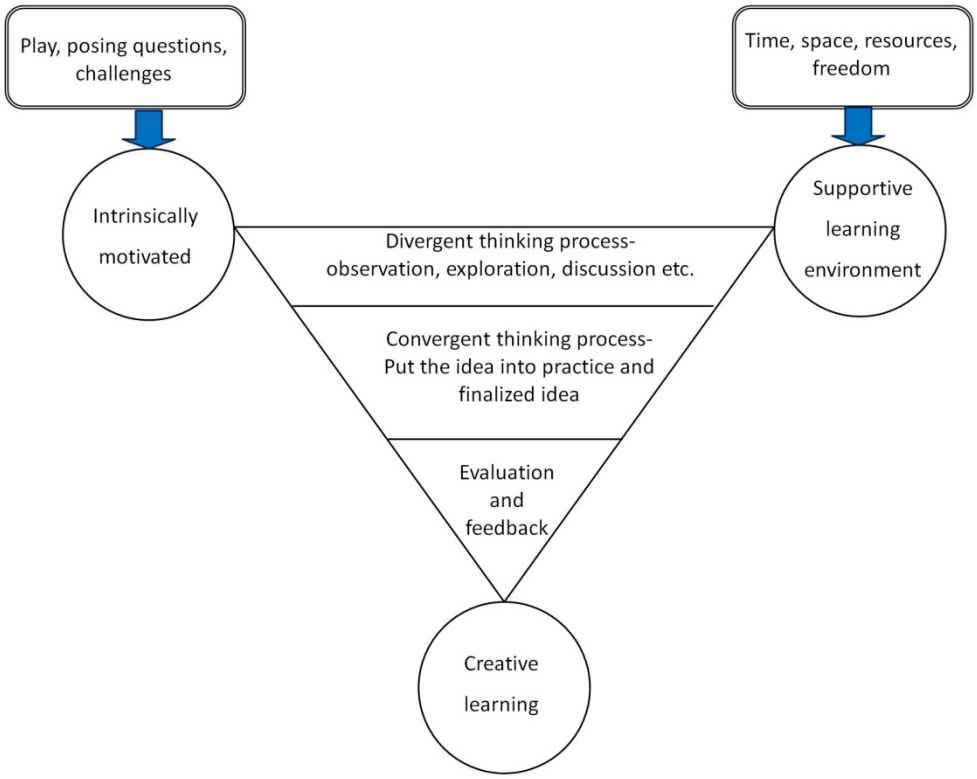

Figure 3.8.The pedagogical framework for creative practice (PFCP) (Cheung, 2016, p.144).

(1) Intrinsic motivation: According to Amabile (1999), intrinsic motivation is crucial for the development of creativity. Strategies such as challenging play and posing questions could be useful to arouse children's interest and motivation during creative tasks (Cheung, 2016).

(2) A supportive learning environment: Many researchers have identified a supportive learning environment as being open and spacious, with sufficient time, space, and rich resources. Such a free and autonomous environment would help children learn (Amabile & Gryskiewicz, 1989; Bancroft, Fawcett, & Hay, 2008; Cheung, 2016; Craft, Cremin, & Chappell, 2007b).

(3) The encouragement of divergent thinking processes to generate ideas: According to the creative process model (Zeng et al., 2011), defining and resolving problems are important concepts in the thinking process. This means that children will create an idea in order to resolve a problem. In this respect, 'strategies such as observation, exploration, and discussion are used to maximise the number of ideas in relation to the creative task' (Cheung, 2016, p.145).

(4) Convergent thinking processes to help select the best idea: Children will discuss both sides (positive and negative) and the best possible way when they are asked to find a solution or idea to resolve a problem in their learning activities (Barak, 2009; Cheung, 2016).

(5) Evaluation and feedback: 'Children are asked to evaluate the quality of the ideas in terms of being innovative, practical, effective, and useful, appropriate and make recommendations for improvement' (Cheung, 2016, p.145).

Cheung (2016) proposed that using the PFCP framework could enhance teachers'

understanding of creative pedagogy and they could use it to develop their competency in generating creative pedagogical strategies. Moreover, this research also showed that the Western perspective of creative pedagogy could be adapted to the Chinese context. On the other hand, it also illustrated that teachers' pedagogical practice is not static; rather, it is open to change and development (Cheung, 2016).

3.2.2 Pedagogy of Possibility Thinking

According to the discussion above, it is argued that creative pedagogy involves three main dimensions, which are teacher, children and the learning environment, for enhancing children's creativity during teaching activities. In my study, I was focused on PT, which is kind of everyday creativity related to our daily life, but which, according to prior studies, is also found in school-based learning. Based on previous empirical researches of PT in the UK, the key points of the pedagogy of PT are reinforced in this section in order to explain the underlying strategies which teachers use to encourage PT behaviour in classroom activity. Cremin et al. (2006) produced a model of pedagogy that can nurture PT (see Figure 3.9). This model shows how the features of PT can be promoted through teacher–child interactions in an enabling context in which teachers provide the time and space for children to develop their ideas and prioritise children's agency (Craft, 2015). Moreover, 'standing back' to observe children's active engagement and determine when to intervene is an important element in the pedagogy model. Documenting this pedagogy is significant in terms of supporting children's purposeful engagement in creative learning as well as fostering their PT.

Figure 3.9 Pedagogy that nurtures PT (Cremin et al., 2006, p. 116)

1. Standing back

   This pedagogical stance refers to being deeply involved with children's learning and considering what they are saying through their engagement in the classroom. Cremin et al. (2006, p.114) described standing back as 'when and how often teachers positioned themselves, such that stopping and observing, and listening and noticing that nature of the learner's engagement was prioritised'. This means that teachers should stand back to closely observe, examine, discuss, and deeply reflect on children's ideas. Standing back has also been deemed central to fostering children's autonomy and providing more opportunity for children to follow their own interests and gain agency in their learning (Aristeidou, 2011; Cremin et al., 2006). The teacher's stance is a 'what if?' agent—an agent of possibilities—to give children the chance to make choices or decisions about their learning activities. Moreover, when discussing the strategy of teachers' standing back, Craft et al (2007a) noted

that teachers can also document these moments in some way, such as taking a mental snapshot or making a note that can be played back later. Reflection on what we learn from both standing back and documenting, also called reflection-in-action, could be used in the educational context to support and stimulate children's learning. Furthermore, working with others to share the experience in a discussion with other teachers or university researchers could help take the next appropriate action in learning (Craft et al., 2007a).

2. Profiling children's agency

Teachers can prioritise children's agency and provide them with various opportunities that not only allow them freedom, but also challenge them, so that they can initiate an activity or make their own choices during their learning. Cremin et al. (2006) also stressed that this could enable children to participate in jointly determining the direction of their work and then exert the best control over their learning. In addition, many researchers have found that the pedagogical practice which could foster children's self-direction and agency is central in the creative teacher's pedagogy (Craft, Cremin, Hay, & Clack, 2013; Cremin, 2015; Grainger, Barnes, & Scoffham, 2006; Jeffery &Woods, 2003). Teachers provide a supportive space for children to exert their agency and shape their agenda while also enabling them to identify and make decisions using their ideas. This strategy could help children try out the possibilities by experimenting with various resources or talking about and discussing the options with one another (Cremin et al., 2006). Such a teacher's stance seems to act as a resource to facilitate children's thinking without directly intervening in their learning. For example, in a study by Cremin et al. (2006), the teacher moved around in the classroom and observed the children's

behaviour, listening to and joining into their conversations during this activity. She frequently provoked the children's thinking by posing another question or using 'what if?' sentences. This kind of pedagogical practice turned the focus back onto the children and enabled them to take responsibility for the choices or decisions related to their own learning.

3. Creating time and space

Creative teachers construct an environment in which space is enriched and there is sufficient time for children to develop their ideas and put them into practice. This can increase children's motivation and encourage them to become involved in the learning activity (Aristeidou, 2011; Craft et al., 2007a). Grainger et al. (2006) also mentioned that flexibility in style and space is another characteristic of creative pedagogy which could vary the template, allowing time for children to have their say, promote the willingness to be spontaneous, and acknowledge the desire to provide an opportunity to each child. This point of view is similar to creating time and space in PT pedagogy. Because the key points of the development of an agenda that can be shared by children and teachers are time and space, children can become more deeply engaged in learning and their agency can be facilitated by the provision of an environment in which they can openly access a wide range of learning resources and make broad choices (Cremin et al., 2006). Creative teachers also take children's ideas and voices seriously, thereby not only listening to children's words, but also making them feel safe in expressing their opinions. Cremin et al. (2006) noted that work-in-progress is a common phenomenon in this kind of teaching, and creative teachers should focus on encouraging children to develop their ideas and find their interest in learning. Children

should be encouraged to discuss their ideas or work with an adult in order to ascertain if they are correct. Therefore, the central point seems to be based on providing time for children to think, imagine, ask questions, experiment, and reflect upon work-in-progress to foster their PT.

Based on the pedagogy documented in 2006, Craft et al. (2012) focused on PT in 4-year-olds' child-initiated play and adults' role and found that the teachers both stepped forward and stood back as appropriate, thereby encouraging children's imaginative narratives through the use of provocation (Craft, 2015; Craft & Chappell, 2014; see Figure 3.10).

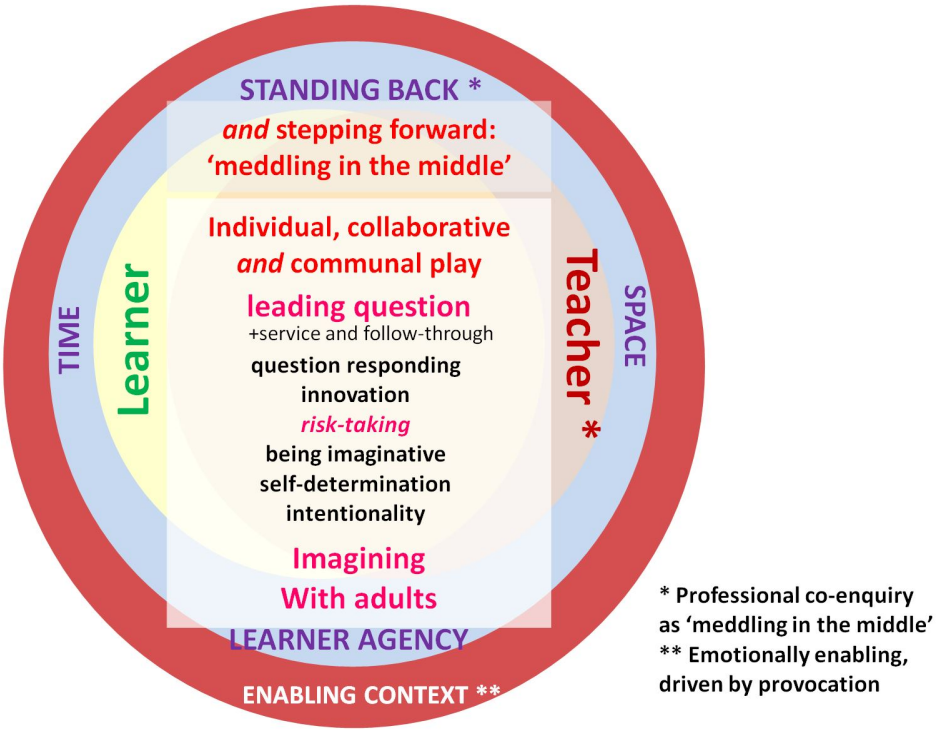

Figure 3.10 Adult and child engagement in play-focused PT

Source: Craft et al. (2012). Possibility thinking: culmination of studies of an evidence-based concept driving creativity? *Education 3-13: International Journal of Primary, Elementary and Early Years Education*, 60.

This study extends the previous work on pedagogy in PT in three aspects (Craft et al., 2012), the first of which is the importance of the role of the provocation, emotional space, and encouragement in the enabling context. Children seem to move toward provocation in groups, which gives them emotional security and encouragement. Appropriate provocation can help children consider information more carefully and stimulate their existing interest. The second aspect is balancing standing back with co-authoring, which means that adults should allow and encourage children's self-determination. This can be understood as 'meddling in the middle', which means co-constructing alongside and with children (Craft et al., 2012, p.71). The third aspect is how professional co-investigations involve meddling in the middle. Some early-year educators regard standing in the classroom as being progressive. Meddling in the middle in this way is partially provocative, but it also provides more opportunities to reflect and plan with a colleague, which can lead to the development of better ideas.

Later wider research that focused on children 3 to 11 years old (Cremin et al., 2012) illustrated that the reciprocity between questioning imaginative engagement and narratives during playful episodes could form children's perspectives (Craft, 2015).This study also revealed that the narrative itself feeds more questioning; therefore, opportunities for narrative development are important in a primary classroom (Craft & Chappell, 2014). Although the teacher poses the questions, the evidence shows that the children's answers and ideas foster other children's interactions. Craft (2015) indicated that children's own fantasy narrative and everyday narrative form part of their explanation during their learning. Teachers can apply more 'what if?' and 'as if' space to step forward toward children, but not so close that children's agency is prevented.

Aristeidou (2011) analysed children's PT and the teaching pedagogy in Cypriot primary education and determined that the main pedagogical methods used were standing back, creating space and time, profiling children's agency, providing an enabling context, flexibility, group work, narration, clear instructions, question-posing, and support and praise. The findings also showed that narration is one of the pedagogical practices that need to be emphasised in primary education.

3.2.3 Creative Environment

Based on research by Craft and her core team, teaching for PT requires an inclusive learning environment with the following features:

1. Children's experiences and ideas are highly valued;
2. Dialogue is encouraged among children and between children and teachers; and
3. An ethos of respect is nurtured, and children, as well as teachers, experience meaningful control, ownership, relevance, and innovation in learning. (Craft, 2015, pp.160–161; Craft & Chappell, 2014, p.3)

A creative environment is an essential element in creative pedagogical practice. The learning environment at school can either support or limit children's creativity. This environment involves not only external resources, but also an open and supportive climate as well as the provision of sufficient time and space for children to develop their learning processes. Sternberg (2010, p.394) proposed that 'creativity is in essence a novel response—a habit—and like any other habit it can be encouraged and discouraged'. Therefore, he suggested three ways to promote creativity: developing a

novel response or habit, providing opportunities, and affording encouragement and rewards (Cremin, 2015).

The permissive atmosphere of a creative environment supports individual children's imaginations and inner motivation while also creating the potential for group creativity (Toivanen et al., 2013). Other researchers have indicated that the teacher's creativity and ability to provide an open and safe learning environment and atmosphere can help children enjoy school and increase their creativity so that they achieve better learning results (Craft, 2005; Jeffrey &Wood, 2003). Davies et al. (2013) emphasised the significance of flexibility in the physical and pedagogical environment. Teachers can use diverse resources to build this kind of creative environment, such as extending the working activity beyond the classroom to places like outdoor spaces or museums, or by forming a partnership with outside agencies (Cremin, 2015).

Toivanen et al., (2013) mentioned that creative children need not only a positive atmosphere, but also the support and encouragement of adults—mainly their parents and teachers. Therefore, teachers should provide a creative learning environment to give children more opportunities in order to maintain and improve their creative learning (Craft, 2005; Jeffrey, 2006). In addition, according to Davies et al.'s (2013) systematic review of previous research, the elements of creative environments and conditions could enhance the creativity of children and young people. In their review, the common characteristics they identified and related to the pedagogical environment included 'teachers balancing freedom and structure and using playful/games-based approaches which help children exercise control over their learning and offer ownership of activities' (Cremin, 2015, p.354).

3.2.4 Teachers' Stance

In their study of teachers' stance in the creative learning of children 4 to 15 years old, Craft et al. (2007b) used a sociocultural approach to learning, following the work of Buner, Vygotsky, and others. They found that 'children's capabilities are seen as personal and social meaning-making, where learning journeys are different and pedagogy involves both scaffolding and modeling' (Craft et al., 2007b, p.137). The findings of this research showed that creative learning involves three aspects of the teacher's stance:

1. Stance towards children's engagement: Teachers' stance is different when teaching children of different ages and also how children may be engaged. The stance shifts from a strong child-centred perspective in the earlier years of school to a much more adult-centric perspective in later years. For example, as children grow older, teachers' stance and expectations move from encouraging the playful involvement of 4- to 5-year-olds to asking children to model adult practices because of the increased focus on assessment and judgment in the curriculum content.
2. Stance towards creativity and creative learning: Teachers' stance in the early years emphasises collaboration, which is highlighted as the key to creative learning. As children grow older, teachers pay much more attention to their self-determination and experimentation. The pressures of the curriculum and assessment are also shown to diminish the opportunities for older children's agency.
3. Stance towards teaching for creative learning: Teachers try to balance structure and freedom for all age groups in their teaching activities. However, teachers' stance is found to shift from exploratory and discovery approaches with a structure focused on exploration for the youngest children to a more subject

knowledge-based structure for older children. In addition, teachers' values are based more on children's independence in performing, creating, and reflecting, whereas they move to an external assessment and curriculum framework as children grow older.

In addition to Craft et al.'s (2007b) findings the teacher's pedagogy is reflected by the task sets and is changed and influenced by external frames of references(e.g., curriculum)as well as time and assessment constraints. Cremin (2015) also indicated that limited encouragement is given to teachers or younger children to adopt a creative mind-set and few rewards are offered for being creative in an educational context with a high-stakes testing system and over-reliance on curriculum control. In this situation, teachers are positioned as passive recipients of the prescribed agenda, and their professional autonomy is constrained. Moreover, the relentless quest for higher standards may foster a mind-set characterised more by compliance and conformity than curiosity and creativity based on children's development. Although creativity is promoted at all levels of education in Hong Kong, there is strong evidence of tensions and challenges in transforming the formal policy requirement into informal playful learning opportunities (Cremin, 2015, p.356).

Despite the limitations in the educational context, some teachers attempt to make changes in their teaching to enhance children's creativity. Cheung (2016) found that pre-school teachers were influenced by the implementation of the PFCP and made some positive changes during a six-month study. They became more flexible in using time and space, adopted a more play-based approach, encouraged interpersonal exchange, and were more focused on individualised scaffolding. Their pedagogy moved from being strongly teacher-centred to a more child-centred practice. In

addition, the findings of a project in England related to CP on children's well-being showed that CP school teachers appeared to want to learn from their artist partners and engaged in reflective review-like discussions about children's learning. Their pedagogic focus shifted from learning outcomes to learning processes, but they also paid more attention to thinking skills, emotional literacy, communication skills, problem-solving, and collaboration (Cremin, 2015).

Cheung (2016) observed that the development of creativity in the Chinese context requires teachers to change their familiar practices. Therefore, the issue of teachers' development is highly interdependent on changing teachers' pedagogy. Because of the importance of promoting creative pedagogical practice, Toivanen et al. (2013) stressed that developing skills for creative teaching should be part of teachers' education. It is vital to equip teachers with the necessary knowledge and strategies to use creative practice in their teaching, especially in the initial stages of teacher training (Cheung, 2016).

In conclusion, within the context of current policy in Taiwan and the importance of PT to the development of creativity in primary education, particularly as it can be construed as being the engine of everyday or little-c creativity, which can be used to resolve problems in our daily lives (Jeffery & Craft, 2004), I identified this as my central research topic. In addition, the sections above also introduced the strategies of creative pedagogy for enhancing children's creativity.

Moreover, this study will focus on the relationship between the children's PT and teacher's pedagogical practice, and interactions in the classroom. Hamre et al., (2013), indicated that children's learning outcomes are linked with the quality of teaching

they experienced during classroom activities. They also developed the conceptual framework to state that the children learn through their interactions with teachers, and it could be delineated into three domains- emotional support, classroom organization and instructional support (Hamre et al., 2013; Hu et al., 2018). Children could feel more competent, independent, and willing to task risks by initiating tasks when adults are responsive to children' needs and provide them with appropriate support at the same time (Hu et al., 2018). In addition, trust and a close teacher-child interaction can decrease aggressiveness and support pro-social behaviour (Demosemlpva & Nisskaya, 2016, p.175). Furthermore, teachers are open and flexible regard to child's response is considered important in the education and teachers should create opportunities for choice and discovery for children which could stimulate children's intrinsic motivation (Beghetto& Kaufman, 2011., Davies el al., 2013., Schoevers et al., 2019). Therefore, teacher-child interactions can provide information about the teacher's strategies and how the children respond to classroom activities.

3.3 Conceptual Framework

This section develops a conceptual framework with which to analyse and explain children's PT and teachers' pedagogical practice after the implementation of FI policy or in a primary class in Taiwan's primary education.

This conceptual framework (see Figure 3.11) is based on a review of the literature related to the theory of PT and creative pedagogy; it also guided the research design before the empirical research began. After reviewing the literature of PT and creative pedagogy, three main dimensions are constructed in the conceptual framework, which are children's PT, teacher's pedagogy (more focused on the pedagogy for nurturing or

decreasing children's PT) and environment in the enabling context in Taiwan's primary education. The data collected from classroom observation will be used to understand how the children's PT perform in Taiwan's primary schools and how do teachers use the pedagogical practice during their teaching to investigate the relation to children's PT behaviour. Moreover, from my reading of the literature review of creative pedagogy, I identified that the learning environment is another factor in shaping the extent to which children are able to develop PT. Furthermore, social and cultural differences between Taiwan and other research contexts and also within the groups of children studied, may affect children's PT and impact on teacher's pedagogy and the learning environment. Therefore, in my conceptual framework, the four external factors I have taken into consideration are difference in curriculum subject, FI policy implementation, context of schools and classes, and teacher's professional development. These will be analysed in this study in order to understand the influence on children's PT, teacher's pedagogy and learning environment.

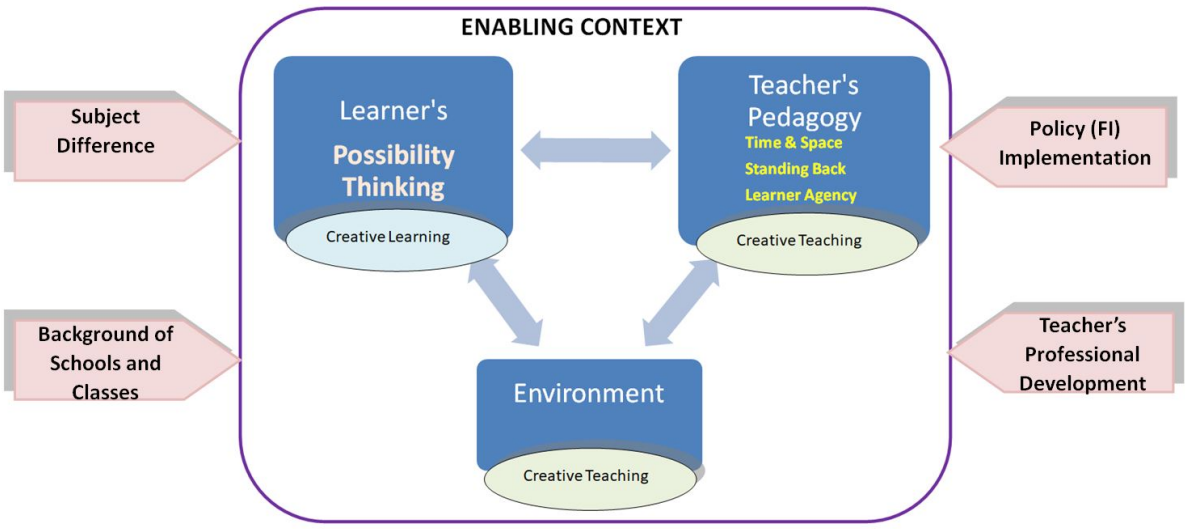

Figure 3.11 Conceptual framework (source: author)

In the following paragraphs, I will explain the central part of the conceptual

framework, which contains children's PT, teacher's pedagogy and environment. The second part will explain why I chose external factors as another dimension in my conceptual framework.

Because the participants in the three cases are between 8 and12 years old, the UK's PT model for 9- to 11-year-olds (Stage 3) proposed by Craft et al. in 2012 (see Figure 3.6, page 86)is used as the basic model to analyse the PT of the children in Taiwan's primary education system. The difference between the PT models in Stages 2 and 3 is that Stage 3 contains one more feature—namely, collaboration. This means that older children will begin to engage in collaborative behaviour when they encounter problems during their learning. Moreover, the risk-taking feature in Stage 2 is absent from Stage 3. Therefore, while observing children's PT performance, I will explore whether these two features exist or not.

The 11 features of the PT model based on previous studies undertaken in the UK context will be used in this study in order to acquire an in-depth understanding of the current performance of children in Taiwanese primary education. These features are question-posing, question-responding, immersion, being imaginative, play, innovation, risk-taking, self-determination development, intentional action, and peer collaboration. However, the features of a PT model for Taiwan may be different based on the cultural and social differences between the UK and Taiwan. Some of these features might be absent from Taiwan's primary education system, or some new features will be identified in this research. In addition, the strength of the PT features in Taiwan's primary education may also be different from that in the UK's results. Because the performance of children's PT features could differ greatly between the two cases in this study, there will potentially be more room for an in-depth discussion and

investigation during the data analysis.

The teacher's role is also very important in Chinese education because it is a teacher-centred system, which is heavily focused on the test-based pedagogical approach in the traditional Chinese society. The predominant teaching pedagogy in Asia is determined by the high standards and expectations of parents and social culture. It could be called an exam-focused education, which over emphasises the skill of memorisation; it would also largely block children's creativity and innovation (Li &Johnston, 2015; Martinsons & Martinsons, 1996; Vandervert, 2013).Based on the significance of the cultural influence and the role of the teacher, I will also focus on the nature of teaching pedagogy used in Taiwan's primary education system as well as the relationship between the different pedagogies and children's PT.

A combination of two models was used to design the conceptual framework of the teaching pedagogy in this research. One was the model of pedagogy produced by a UK empirical study (Cremin et al., 2006) which can nurture PT (see Figure 3.9 on page 97). This model shows how the features of PT can be promoted by teacher–child interactions in an enabling context in which teachers provide the time and space for children to develop their ideas. They also prioritise the children's agency and stand back in order to provide a more supportive environment for children to express their ideas.

Because the environment can also be an important issue for enhancing children's creativity during the learning and teaching activities, teaching for creativity—a creative pedagogy model proposed by Lin (2011)—also indicates the importance of a creativity-supporting environment (see Figure 3.7 on page 89). Many researchers have

also observed that the learning environment at school can either support or limit children's creativity (Craft, 2015; Craft &Chappell, 2014; Cremin, 2015; Sternberg, 2010). If there is an open, creative, and supportive learning environment at school, children can develop their learning processes with more creativity and imagination.

The teaching methods from teachers' pedagogical practice will also be a point of observation in this research. Because didactic instruction is a traditional method widely used for teaching many subjects in Taiwanese education, this study also aims to understand the instruction methods teachers use in primary schools and their relationship with the children's PT performance during different kinds of teaching practices in Taiwan's primary education.

Creative pedagogy does not only include the environment. In fact, Lin's (2011) model of creative pedagogy highlights three elements that need to be addressed in Taiwan's primary education system: the teacher, the child, and the environment. Therefore, these two models have been combined and used in the data analysis in this study to distinguish the pedagogical practices teachers use in Taiwanese primary schools and to identify any new pedagogical features.

In summary, the following four research questions (RQs) are addressed in the conceptual framework of this study:

1. **Is there any evidence of PT in Taiwan's primary schools?**
2. **How do children in Taiwan's primary schools use PT during the learning process?**
3. **What is the nature of teachers' pedagogical practices in Taiwan's primary schools?**

a. How do teachers use pedagogical practices in the implementation of Taiwan's creativity education programme (FI) or in a primary class without joining the FI?
b. What are the differences between the pedagogical practices used by teachers in different classes (primary class, talented class)?
c. What are the differences between the pedagogical practices used by teachers to teach different subjects?

4. What is the relationship between children's PT and teachers' pedagogy in Taiwan's primary schools?

Because creativity is gradually developing as an ideology of influence in Eastern culture, creativity in Asian countries, such as Taiwan and China, has gradually become an area of exploration for curricular reform in education (Wu, 2004). Moreover, because the development of children's cognition and learning is closely related to the social-cultural environment, which is widely discussed and acknowledged throughout the world, external factors, such as the implementation of an educational policy, the social context (background of schools and children or social class), and even the differences in teachers' professional training, may all be important elements of the development of children's creativity. In addition, Vong (2008) noted that Bruner also indicated that human cognition and development are strongly linked to the influence of the cultural context in which people live.

According to Hui et al. (2015, p.213), Rudowicz posed that the epistemological understanding of creativity is deeply influenced by the sociocultural perspectives on creativity. They also mentioned that appropriateness/usefulness is often more important in the East and the Chinese culture (Hui et al., 2015). Therefore, because these sociocultural factors might determine the value and nature of creativity and also

affect the use of different pedagogical approaches to teaching creativity, it would remind the researcher to be more careful when evaluating the reasons why what is valued can be regarded as valueless in one culture and consider these factors in the research to see the influence in creativity.

Lubart (1999) suggested four ways of studying cross-cultural creativity:

- People from different cultures may have different concepts of creativity.
- People from different cultures may use different psychological processes when they engage in creative endeavours.
- Language may influence the development of creativity.
- Environment can either promote or reduce people's creativity. (Niu & Sternberg, 2001, p.230)

Therefore, the influence of Chinese culture has become one of the important issues in recent creativity studies conducted in various Asian countries, such as China, Hong Kong, and Taiwan, when seeking to understand the development of Chinese creative education. For example, Confucianism and Taoism are two major cultural factors related to teaching for creating and maintaining social stability and organisation as well as the education of behaviour in Chinese societies (Wu & Albanese, 2010). Moreover, the Chinese culture is a collectivist one; thus, it focuses on interpersonal relationships in social society rather than individuals' ideas of self in the group, which would certainly influence children's development (Vong, 2008). Niu and Sternberg (2001, p.228) noted that 'people in Eastern cultures (such as Chinese or Japanese cultures) hold an interdependent perspective of the self, in which people's motivation is usually to find away to fit themselves in with relevant others—to become part of various interpersonal relationships'.

Due to the importance of the different social and cultural contexts between Eastern

and Western countries, some external factors related to the sociocultural environment may affect children's creative development or have an obvious influence on teachers' pedagogical practices and thus should also be considered when promoting creative education in Taiwan. For example, the examination-focused culture and high expectations of children's learning from parents' perspective tend to put pressure on teachers to change their pedagogical approach. Ng and Smith's (2004) study in a Taiwanese classroom concluded that conflicts arise when promoting creativity and creative pedagogy in an Asian context because of the different social discourses. Their study also found that the features of creativity, such as being innovative, thinking independently, and taking risk, are not valued during learning activities.

Therefore, the conceptual framework model (See Figure 3.11, Page 108) in this study that also indicates the kind of external factors that may influence the development of creative education in Taiwan's educational system.

I previously mentioned that some literature indicates that traditional values and beliefs remain beyond time and space as well as influence or shape schools' culture, professional development, teaching approach, learning climate, and teachers' understanding of creative education. Furthermore, the impact of teachers' guidance on children's learning, their role in lesson planning, and their teaching skills are key themes that run through the implementation of creative education in Chinese society (Vong, 2008). Therefore, the background of schools and children, the number of children, and the type of class will influence the learning climate or curriculum structure as well as the flexibility of teachers' teaching. For example, different subjects may have different learning goals, which would affect teachers' curriculum design or require teachers to use different instructions to support children's learning in

the course. Therefore, children's PT and teachers' pedagogy may also have a different appearance in different subjects, differently aged children, or different types of classes. These factors could be seen as the external elements potentially affecting children's PT and teacher's pedagogy during the teaching, and this study will analyse these factors to determine how they influence the development of children's creativity and teachers' pedagogical practices in Taiwan's primary schools.

Chien and Hui (2010) examined the perception of preschool teachers in Taiwan, Shanghai, and Hong Kong. They discovered that, although Taiwanese teachers knew more about the influential factors of a creative performance than the other two groups, they lacked confidence in their ability to achieve this educational goal because of their perceptions of parents' negative attitude to creative education. Thus, teachers need to communicate and collaborate more with parents to enhance children's access to creative education and their own creative competence. Two of the most important issues in Asian creative education is enabling teachers to develop a deeper understanding of creativity and the acquisition of the relevant knowledge and teaching skills to foster creativity in children. Furthermore, teachers' professional development to enhance their knowledge of creative teaching would also be helpful when promoting creative education in Taiwan. Cheung (2016) maintained that the development of creativity in the Chinese context requires teachers to change their familiar practices. Thus, teachers also need to learn new teaching skills to enhance children's creativity in their classes. Therefore, the issue of teachers' development is greatly interdependent with a change in pedagogy. If teachers realise the importance of creative education and have the relevant skills to teach creatively, they may be more motivated to teach creatively in their classes. Therefore, understanding if teachers' professional training of creative education would affect their pedagogy in

Taiwanese education will be another aim of this study.

On the other hand, although it is not compulsory for schools in Taiwan to adopt a creative educational policy, it would encourage more schools and teachers to attend the related creative policy in the future when they realise that implementing the policy could enhance creative teaching and learning in the Taiwanese educational system. Therefore, I include the implementation of the FI policy in my conceptual framework to determine if a difference exists between the development of the creative performance of children and teachers between the schools, which have or have not implemented the FI policy. The findings in this part may also provide some suggestions for the design of future policy to promote creativity in Taiwanese education.

Therefore, the fifth main research question (RQ) which focuses on the external factors of creative education in this study, is as follows:

5. **What factors and processes contribute to changing teachers' creative pedagogy and children's PT in Taiwan?**

In conclusion, the conceptual framework for this study is based on a review of the literature and a selection of key studies deemed to be the most useful for framing the research. The theory of PT and the creative pedagogy in the creative education policy implemented in Taiwan in particular enabled the design of research that facilitated a more in-depth understanding of the relationship between children's PT and pedagogical practice in a primary classroom.

Having considered the features of PT in Stage 3, as posed by Craft et al. (2012), and

the creative pedagogy models produced by Lin (2011), Cremin et al., (2006) and others, a multiple case study was deemed to be the most suitable approach by which to study the enactment of children's PT in relation to teachers' pedagogical practice in two kinds of classrooms in Taiwanese primary schools. These are primary classes and talented classes of three different Taiwanese primary schools in two schools, which have implemented the FI policy. Talented classes in Taiwanese primary education are not individual classes; rather, the chosen children are placed in a talented class in a particular course, such as Chinese or mathematics, and the teacher provides them with a special course based on their learning status. Although it is not compulsory for schools to participate in Taiwan's creative educational policy, it is important to ascertain if the implementation of this policy can enhance creative teaching and learning in the Taiwanese educational system. Therefore, the implementation of the FI policy is included in the conceptual framework of this study.

3.4 Conclusion

Literature related to the implementation of Taiwan's policy of future imagination (FI) and creativity, PT, and creative pedagogy in PT was explored in Chapters II and III of this thesis. Not only were the theories related to future imagination, PT, and creative pedagogy introduced, but their importance and influence on primary education were also identified. This was followed by the creation of a conceptual framework based on the literature to be used as the analytical framework for this study. The process of undertaking the fieldwork and analysing the data is discussed in later chapters.

Chapter IV
Methodology

In this chapter I discuss the methodology adopted in my research. The first section contains the research objectives and questions, which led to the development of the research design. An appropriate paradigm on which to base the research is identified in the second section, while the research design, including the research questions, the research methods, and the data collection method used to achieve the results of this empirical study, are explained in the third section. The adoption of a pilot study to verify the validity of the data collection approach is described in the fourth section, as is the technique used to analyse the data. Finally, ethical considerations and potential problems encountered throughout the study are discussed in the fifth section.

4.1. Research Objectives and Questions

The aim of this study is to determine the changes in Taiwanese children's PT engendered by the implementation of the government's creativity education programme by examining the constituents of PT from the perspective of children's learning experience in addition to understanding how teachers foster children's PT as an aspect of creativity. The relationship between children's PT and teacher pedagogy (TP) in teaching and learning at the primary schools is also an important area of this research requiring significant attention to acquire an in-depth understanding of PT in Taiwan. Some recommendations are made at the end of the research for the professional development of teachers' creativity teaching skills, and some indicators are identified for evaluating the teaching of creativity education. In order to achieve these specific objectives, the working research questions are as follows:

1. **Is there any evidence of PT in Taiwan's primary schools?**
2. **How do children in Taiwan's primary schools use PT during the learning process?**
    a. How do children's PT skills differ in classes with and without the implementation of Taiwan's creativity education programme (FI)?
    b. How do children's PT skills differ between the classes studied?
    c. What factors and processes have contributed to changing children's PT in Taiwan's creativity education?
    d. What has caused these changes in the development of children's PT skills?
3. **What is the nature of teachers' pedagogical practices in Taiwan's primary schools?**
    a. How do teachers use pedagogical practices when implementing the creativity education programme (FI) in Taiwan or in a primary class without joining the FI?
    b. What are the differences between the pedagogical practices used by teachers in different classes (primary class, talented class)?
    c. What are the differences between the pedagogical practices used by teachers to teach different subjects?
4. **What is the relationship between children's PT and teachers' pedagogy in Taiwan's primary schools?**
5. **What factors and processes contribute to changing teachers' creative pedagogy and children's PT in Taiwan?**

4.2 Locating an appropriate paradigm

The main aim of this study is to ascertain the extent of children's PT. From my review of the literature presented in Chapter III, particularly the work of Craft and colleagues (Burnard et al., 2006; Chappell et al., 2008; Craft, 2000, 2001; Jeffrey, 2005; Jeffrey & Craft, 2004),PT can be defined as the engine of everyday or 'little-c' creativity, which involves a shift in identifying, honing, and resolving problems. Everyone possesses the ability and potential for PT and may use it routinely in everyday life; however, to date, relatively little research has examined the topic, and almost no such studies have been conducted in the Taiwan context.

Therefore, the PT provides a new viewpoint for the creative field, and it has truly become quite a new topic in recent years, including in Taiwan's education. In order to achieve a deeper realization of PT in the Taiwanese learning context, more empirical studies are necessary to find more evidence of its existence and how it is enacted in practice. Hennink, Hutter, and Bailey (2011) advocate the use of qualitative research when exploring new topics or complex issues. It can also be used to explain people's beliefs and behaviour and to understand issues related to 'how' questions that describe a process, such as how people make decisions or solve problems. It also means that PT is the cognitive ability of people to ask or answer questions to solve difficulties or problems in their daily lives. Moreover, because the main aim of this research is to acquire an in-depth understanding of PT in children, which relates to examining human behaviour, qualitative research is deemed to be the most appropriate and useful approach for addressing the research questions, as will be discussed in a later section.

Examining the different methods or perspectives that could be employed to find the answers to the research questions is useful for ensuring the adoption of an appropriate

research paradigm. In order to answer the research questions and read the aims in this study, determining how to locate the appropriate paradigm and find the methods for obtaining the evidence of PT and TP is the first step in my research.

In order to address the central aim of this research—namely, to explore what constitutes PT in children's learning experiences—it is necessary to analyse the underlying ontology, epistemology, and methodology deployed in this study.

Ontology refers to what people think reality looks like and their views of the world (Denzin & Lincoln, 2008). It can also reflect 'the nature of phenomena, or entities, or social reality' (Mason, 2002, p. 14). Thus, the reality in this research is children's PT, as described in Chapter III. Moreover, PT can be defined as the engine of everyday or 'little-c' creativity, which means that this kind of creativity focuses on individuals' potential to be creative and solve the everyday problems they encounter in life. Based on this meaning of PT, it is evident that everyday reality exists for everyone; however, it is unlikely to be completely captured and may need to be critically examined to be fully understood.

Meanwhile, epistemology is 'concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate' (Maynard,1994, p. 10);it also represents knowledge or evidence of the social reality being investigated (Mason, 2002). Denzin and Lincoln (2008, p. 31) explain that epistemology explores issues such as 'what the relationship is between the inquirer and the known'. In short, the epistemology informing this research is the relationship between the reality (the result) and the researcher; therefore, in this study, I will analyse and construct a model of PT from the

observation of children so that the findings will illustrate the structure and model of PT in Taiwanese education. It could also be explained as the findings or results will be constructed by the researcher.

The last element to be considered is the methodology, which refers to the approach employed to collect the data (Hennink et al., 2011). Crotty (1998) defines methodology as the strategy, plan of action, process, or design that will influence the choice and use of particular research methods. In addition, according to Crotty (1988), the researcher should gather and analyse the necessary data based on choosing or designing the methods that can appropriately answer the research questions or test the hypotheses. In my study, the primary purpose is to generate an in-depth understanding of a model of PT in Taiwan; an approach method to collect the data is considered a case study, which is defined as 'an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin, 2009, p. 18). Consequently, a multiple-case study approach is used in this research, and classroom observation is mainly utilised as a data-gathering technique, together with interviewing teachers, a documentary analysis, and videos.

In conclusion, this study can be based on the two paradigms of post-positivism and constructivism. Because of the beliefs of ontology (Denzin & Lincoln, 2008, a post-positivism perspective of reality is used in this study. In terms of epistemology, the researcher is attempting to find and construct a concrete PT model by observing the participants and then explaining the results. Moreover, a case study approach and observation will be used in this research. Because the researcher will focus on explaining and constructing the data from observations, the paradigm of

constructivism may also be involved in this research. Therefore, these two paradigms are included in my study.

4.3. Research Design

According to Crotty (1998), the research methodology can be defined as a strategy or plan of action that shapes the researchers' choice of particular methods and it is linked to the desired outcomes of the study. I am adopting the case study approach in my research because Yin (2009) describes a case study approach as 'an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (p18). A case study is a research approach or research strategy that focuses on understanding the dynamic present in a single setting. Gummesson (1988) argues that one of the advantages of using a case study is that it provides an opportunity for a holistic view of the process. Therefore, a multiple-case study design is employed in this study to investigate research questions Q1 Q2 Q3 Q4 and Q5 (the research questions could be read in Page 119).

Since the case study method involves detailed observations, it facilitates the study of many different aspects, which can be further examined in relation to each other. It also provides a view of the process within the total environment, as well as utilising the researcher's capacity for 'verstehen[2]'. (p. 52). This method enables the researcher to examine the data in a specific context more closely. As a research method, case studies are used in a variety of situations to derive knowledge of individuals, groups, organisations and social, political, and related phenomena (Yin, 2009). Therefore, case studies enable investigators to retain the holistic and meaningful characteristics

[2]The 'verstehen' is a German word which means 'to understand'.

of real-life events and understand complex social phenomena.

Yin (2009) states that case studies can involve single or multiple cases; moreover, they can contain an embedded design which involves multiple levels of analysis within a single study (Yin, 2009; Eisenhardt, 1989). Merriam (1988) proposes that 'case studies are particularistic, descriptive, and heuristic and rely heavily on inductive reasoning in handing multiple data sources' (p.16). As a result, case studies do not use any one particular type of evidence, but may draw on multiple types, which may be qualitative, quantitative or both. It may combine different data collection methods, such as interviews, questionnaires, fieldwork, archival records, verbal reports, and observations (Yin, 1981; Eisenhardt, 1989). Simons (2009) also defines a case study is an in-depth exploration of the complexity and uniqueness of a specific project, policy or programme in a real-life context for multiple purposes.

There are several categories of case study, and Stake (1995) proposes three of them, namely, an intrinsic case study, instrumental case study and collective case study; meanwhile, Bassey (1999) categorises case studies into theory-seeking and theory-testing, story-telling and picture-drawing, and evaluative. Moreover, Yin (2009) observes that there are three categories, namely, exploratory, descriptive and explanatory case studies. Firstly, the aim of an exploratory case study is to explore any phenomenon in the data and this may entail a pilot study, prior fieldwork or small-scale data collection before proposing the research questions and hypotheses. Secondly, a descriptive case study is designed to define the natural phenomena that occur within the context, and the challenge of this type of case study is that the researcher must begin with a descriptive theory to support the definition of the phenomena. Thirdly, an explanatory case study is used to examine the data closely at

both a surface and in-depth level in order to explain phenomena in a real-life context. This type of case study is used if the researcher aims to answer questions in real-life interventions that are too complex for a survey or experimental technique. Moreover, explanatory case studies can also provide explanations to link the implementation with effect of a programme (Yin, 2009).

Each of these types of study can be used in either single or multiple cases; furthermore, they can also be used in a longitudinal design with the aim of discovering and explaining changes in the case over time, or in a comparative design, which is used to discover and explain the differences between cases. Researchers can choose either a single-case or multiple-case design depending on the issues in question. A single case is a common design for a case study and this can make a significant contribution to building theory and knowledge when there are no other cases available to replicate. According to Yin (2009), a single-case design has five rationales, which make it eminently suitable in certain conditions, namely where the case represents (a) a critical test of an existing theory, (b) a rare or unique circumstance, or (c) a representative or typical case, or where the case serves a (d) revelatory or (e) longitudinal purpose (Yin, 2009, p. 52). On the other hand, a multiple-case design can be adopted with real-life events that show many different kinds of sources of evidence through replication rather than sampling logic. In addition, the multiple-case study enables the researcher to explore differences within and between cases with the goal of replicating the findings across cases. The individual cases within a multiple-case study may be either holistic or embedded, and each individual case study may also include a quantitative data collection and analysis (Yin, 2009). Herriott & Firestone (1983) also propose that the evidence from a multiple-case study is usually considered to be more compelling and robust than the

findings from a single-case study. Moreover, a multi-case study can provide descriptions of an issue and comparisons with other issues (Creswell, 2011). According to Yin (2009), the two essential elements of a multiple-case study approach are the collection of multiple forms of data and the location of the cases within a social context.

However, both single and multiple case studies include two different variants, namely, holistic designs and embedded designs (Yin, 2009). A holistic design is used to examine the global nature of a phenomenon, organisation or programme, whereas an embedded design pays attention to the sub-unit(s) in the case(s). Yin (2009) argues that a holistic design 'is advantageous when no logical sub-units can be identified or when the relevant theory underlying the case study is itself of a holistic nature' (p.50). He also maintains that a typical problem with a holistic design is that the entire case study may be conducted on an unduly abstract level, thereby lacking sufficiently clear measures.

On the other hand, an embedded design enables the researcher to explore the case(s) while considering the influence of various units. In a single-case study, an embedded design could be used to examine the sub-units situated within a larger case or project. For example, Yin (2009) proposes that 'even though a case study might be about a single organisation, such as hospital, the analysis might include outcomes about the clinical services and staff employed by the hospital.' (p.50) Furthermore, a survey may need to be conducted of each case study setting in an embedded multiple-case study.

4.3.1 The Research Approach

To address my research questions and following an extensive literature review of case study as reported in the previous section, this study deployed a 'multiple-case study' as the research approach. There are several reasons for choosing a case study design for this research:

Nature of the research questions: Yin (2009) suggests that a case study design is useful when asking 'how' or 'why' questions because it can facilitate the investigation of the reasons and find answers to the questions. Because the aim of this study is to examine the constituents of PT in children's learning experiences and understand how teachers foster children's PT as an aspect of creativity when implementing Taiwan's creativity education programme (FI), many 'how' and 'why' questions are involved in understanding the relationship between PT and pedagogy. Therefore, a case study approach is deemed to be the most appropriate for answering these research questions and enabling the researcher to obtain a more in-depth understanding.

Nature of the phenomenon: According to Gummesson (1988) and Yin (2009), a holistic case study can be used to examine the global nature of a phenomenon and provide an opportunity for a holistic view of the process. Simons (2009) also states that a 'case study has the potential to engage participants in the research process' (p.23). In this research, because the potentially important variables or phenomena of children's PT are not all based on previous studies in Taiwan, it is essential to utilise a case study design that allows for an open mind within a given research range.

Nature of the context: A case study can be used to explore or describe the data in a real-life environment, but it also helps explain the complexities of real-life situations

which may not be captured by experimental or survey research (Bassey, 1999; Simons, 2009; Yin, 2009). In addition, the data are often examined within the context of their use (Bassey, 1999; Yin, 2009). Thus, various data collection techniques can be used to obtain different data and resources in real-life situations by using a case study to explore students' PT during their learning process in my research.

Nature of the event: According to Yin (2009), case studies are suitable when contemporary events are being investigated and when the behaviour cannot be controlled. Because children will display their PT during their daily lives, the researcher should provide them with a real-life context and not try to control their behaviour. In addition, case studies can also be utilised to investigate people's behaviour and beliefs by describing, analysing, and interpreting data as well as focusing on single or small numbers of individual events, activities, or phenomena (Creswell, 2011; Yin, 2009). Furthermore, in order to enrich the data, a variety of intrinsic, instrumental, and collective approaches to case studies could facilitate both quantitative and qualitative analyses of the data (Simons, 2009; Yin, 2009). The available material is eminently suitable for a case study strategy using observations, interviews, and documents. Thus, adopting case study research can furnish this study with a huge variety of evidence derived from documents, videos, and interviews. It also fits the aims and would be an appropriate methodological approach for my study.

However, case studies also have some limitations. For example, according to Yin (2009), case studies are often accused of lacking rigour. Because a case study may involve a lot of time in the research process, the investigator may feel tired and become careless, and allow ambiguous evidence or views to influence the direction of the findings and conclusions. Simons (2009) also states that case studies may involve

too many personal points of view; moreover, they are often labeled as being too long, difficult to conduct, and producing a massive amount of documentation (Bassey, 1999; Yin, 2009).

In addition, the most common concern about case studies is that they provide little basis for scientific generalisation by using a small number of subjects; in fact, some are conducted with only one research subject (Bassey, 1999; Simons, 2009; Yin, 2009). Maxwell (1992) suggests that generalisability is normally based on the assumption of being useful in making sense of similar persons or situations. Therefore, "How can you generalise from a single case?" is a frequently-heard question (Yin, 2009, p. 15), and Yin's (2009) response is that 'these case studies, like experiments, are generalisable to theoretical propositions and not to populations or universes' (p. 15). He also states that there is a difference between statistical generalisation and analytical generalisation, and while survey research tries to generalise findings to the larger universe, case study research aims to generalise a particular set of results to a broader theory. Moreover, Hartley (1994) expresses a similar perspective. Detailed knowledge of the organisation and especially of the processes underlying the behaviour and its context can help to specify the conditions under which the behaviour can be expected to occur. In other words, generalisation is about theoretical propositions rather than populations (p. 225).

However, is far more important to choose a representative or typical case for the research when using a case study method than recruiting a large sample size (Hamel et al, 1993; Yin, 2009). Therefore, the researcher should expand and generalise theories rather than enumerating frequencies or quantities of data, and one way of overcoming this problem is by triangulating the case study with other methods.

According to Denzin (1984), there are four types of triangulation, namely, methodological triangulation, data source triangulation, investigator triangulation, and theoretical triangulation, each of which can provide a different aspect to enhance the validity of the research when using a case study design.

A multiple-case design is adopted for this research, since the primary purpose is to generate an in-depth understanding of the children's PT and teachers' pedagogy in Taiwan's primary education. Although the drawback of a case study design is its inability to provide generalisable results, different methods of triangulating the study are used in order to confirm the validity of the process. A multiple-cases study approach bound as classroom interaction is adopted to facilitate the collection and analysis of data in Taiwan. A documentary analysis is used to analyse PT research in the UK and the documentation of Taiwan's FI policy. The target participants in this study are students aged 9-12 and their teachers from three classes in three primary schools, two of which have been selected to join the MOE's "Imagination Plan". The other is a primary school in Taiwan which can provide the general picture of most of Taiwan's primary schools.

4.3.2 Research Procedure

Three qualitative methods are utilised to collect the data for this research, namely, a documentary analysis, observation, and short interviews with teachers. The research procedure is shown in Figure 4.1 and described below.

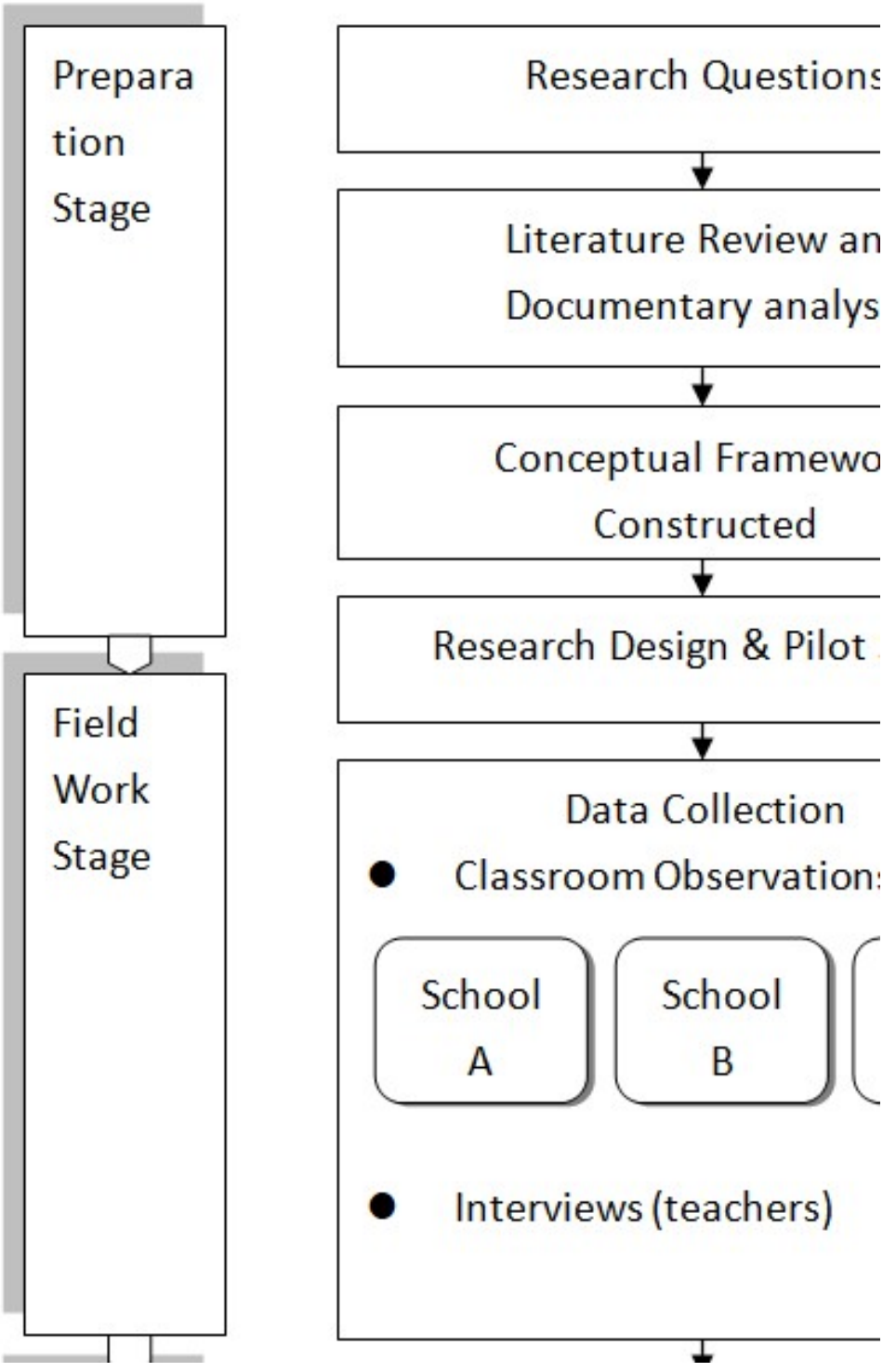

Figure 4.1 Research Procedure

First stage -Preparation Stage: This stage focused on conducting a documentary analysis, which is useful for understanding the government's educational evaluation and operation (Pawson and Tilley, 1997). Extant data and literature related to PT (UK)

and the Future Imagination Policy (Taiwan) will be collected, examined, and analysed and in turn this will help to shape the conceptual framework along with the literature reviews and research questions. Moreover, the pilot study will be applied before the main study to allow for any modifications in the research design.

Second stage -Field Work Stage: This stage includes a pilot study and the main study based on 4 hours (two subjects) of classroom observation in one class of the primary school in the pilot study, followed by a total 100 hours' classroom observation of three different classes in the three primary schools in Taiwan.

Creswell (2009, p.179) proposes that observation can help investigators to gain first-hand experience of the participants and record information about situations as they occur. Video recording will be used to record the whole observation in three schools. According to previous UK studies of PT which used the video-stimulated reviews (VSR) as part of the data collection, VSR are usually used in the classroom to stimulate reflections, together with the charting of critical incidents and phases that involve PT (Cremin et al., 2006; Walker, 2002). This approach is deemed to be appropriate and useful to my research in looking more deeply at PT and classroom pedagogy.

Moreover, this stage will also include short interviews with the teachers who are observed in this study. Interviews can facilitate the collection of a large amount of data about a particular topic, and are useful for gathering in-depth information from interviewees, especially when the participants or some previous personal experience cannot be directly observed when collecting the data.

Third stage -Data Analysis Stage: This stage will involve the clarification, testing and triangulation of the research findings, together with the collection of 100 hours of videoed observations. The data related to the constituents of PT and the pedagogy in Taiwan's primary education will be triangulated. After the data analysis, I will discuss the findings of my study to answer the research questions and then the conclusion and reflection will be completed in the last chapter.

4.3.3 Background of the three cases and the participants

(1) School A (Participating in the FI policy, primary class)

Primary school A is a relatively small school in Taipei city with only 12 classes, 174 children and 42 teachers. It is located away from the main city between the Keelung River and Tamsui in a very beautiful and abundant ecological environment. However, this school is economically disadvantaged based on its location and many of the students come from disadvantaged families. This means that the background of children in primary school A is usually low-income families and they may need more subsidies and allowances from the government.

Although school A is located in an area that is economically disadvantaged, the climate in this school is positive and friendly. The teachers and children have an extremely close relationship. The school administration team provides support for teachers and children and the teachers appear to be passionate and highly motivated in their teaching. The school often participates in different kinds of competitions, such as aboriginal dance or choir contests, and experimental curriculums in the new educational policy. The head teacher in primary school A is keen to improve the

school facilities, and help teachers and children to solve problems during their teaching and learning. She also provides the teachers with a great deal of freedom to teach their students. Based on support from the school, the teachers are willing to attend or design some learning activities for children that are not included in the routine courses.

The participants from this school are 18 sixth-grade children and two teachers and the observed subjects are the Chinese Language, Mathematics, Science, Computer Science, and the Integrated Curriculum. 32 hours of video data is collected from primary school A.

School A in this study could provide information about children's PT performance in primary class and the relation with teacher's pedagogy and policy implementation. In this case, teachers in the class of school A are more interested in enhancing children's creativity and imagination, and they also have the related training of creative teaching. It would be very useful to observe what kind of pedagogical practice teachers used in their teacher and the interaction between children and teachers during the courses.

(2) School B (Participating in the FI policy, talented class)

Primary school B is located in the Shi-Lin district of Taipei city, a prosperous and flourishing area. It has 36 classes, including4 classes of special education (2 talented classes and 2 resource classes). The teacher of the talented classes in school B is passionate about participating in this educational programme in order to enhance the children's creativity and imagination. According to the MOE's policy of 'Future Imagination (FI)'documentation, the school has participated in the FI for two years

and will continue to do so in the future.

In Taiwan's primary education system, the 'talented class' is not a separate class. The children of the so-called 'talented class' still belong to the main primary class for much of the time, but are required to attend some special and additional courses. The early identification of 'talented' children in Taiwan extends back several decades and reflects a societal and educational belief in the importance cultivating motivated, diligent and independent learners. The children who are selected have been identified as having particular learning skills as much as a specific innate talent in a subject for example mathematics or music. They may have shown high level study skills, perseverance and dedication to learning. It can be problematic to attach specific labels such as 'talented' to children's ability at a young age and this may impact negatively on sense of self-worth and confidence for those children who are not selected for the talented class. It might also be the case that too much emphasis is placed on academic skill rather than developing the whole child i.e. socially and emotionally. Further greater attention paid to talented children, through additional resources and better qualified teachers thus raises issues of equality of educational opportunity. Variants of this selective process can be found across the globe and not only in Taiwan. A full and detailed analysis of the research literature on selective education is beyond the scope of this thesis. However, it is important to be aware of the potential difficulties in selection and how it might impact upon my research.

In this study, I chose the talented class as one of my case study classes because I wanted to reflect the range of primary class experiences in the system, and to investigate any differences in children's PT performance between the standard primary and talented class classes. I followed the same procedure in undertaking the

field work in each class.

The children of the talented classes are selected from primary classes and tested. Since the children in the talented class will be required to do a substantial amount of extra work, the teachers need to ensure that each child has the ability to cover all the work from the original class and the talented one. Only 13-15 children are selected from each grade. In terms of the timetable for the talented class, the children need to leave their original class for particular subjects (such as Chinese, Maths or Social Sciences) in order to attend some special courses designed by the teachers of the talented class.

On the other hand, the teaching methods and curricula of the talented class are very different from those of the primary classes. Every term, the teachers design different kinds of courses that may include 2-3 different subjects. Some courses may have 2-4 teachers teaching in a team so that they can provide more support for the children in their learning activities. Therefore, the diversity of the courses in the talented class is also a feature of the special education provided by the school. Moreover, because of the excellent learning competence of the children in the talented class, they often represent the school in many competitions, such as an invention competition, technology competition, or a science research competition.

The main participants from primary school B in this study are 15 fifth grade children in the talented class (11years old) and 1 teacher. There are 30 hours of video data from primary school B covering two courses, the debate course and the individual research course. These two courses are briefly described below.

Firstly, the debate course is an elective course for all fifth grade students in the talented class in the first term. The aim of this course is not only to help the children to understand and participate in a debate competition at the end of the term, but also to enhance their critical thinking and dialectical logic thinking. Therefore, the teacher designed the learning activities and taught them the rules of the debate before inviting the children to select a topic and dividing them into two groups (in favour of and against the motion). Subsequently, he collected the data, developed the argument, and practiced the procedures of debate.

Having learnt the debating rules and discussed the possible debate topics, the children chose 'The Abolition of the Death Penalty' as their topic for the debate competition and started to collect evidence to support their views. During the preparation for the debate competition, the teacher provided the children with space and support, but also established clear rules, which included not making a noise and not fighting if group members disagreed. Children in the talented class could use computers or other materials to search for evidence, and how to clearly organise the evidence for the argument and refutation was also an issue for children to learn in this course.

Secondly, individual research design is a major course for children in the fifth grade talented class. The first task in the fifth grade entails training the children how to conduct research because every child needs to complete a mini empirical research project in the second term of the sixth grade. At the beginning of the course, the teacher explained the definition of research and the process of conducting it and then provided examples of empirical studies completed by previous students in the talented class.

In addition, the children spent a great deal of time selecting a topic in which they were interested and trying to construct the research design for their project. Completing a research project is a really difficult task for children who are only 11 years old; therefore, the role of the teacher is vital in this course. This teacher not only needed to teach the children about methodology but also had to provide a substantial amount of support for individual children who encountered different problems or who were not making good progress during the course. The aim in this term was to teach the children to understand the concept of each research process and decide the topic of their research.

(3) School C (NOT participating in the FI policy, primary class)

Primary school C is a large primary school in New Taipei city. It is located in the central area close to transportation hubs and businesses. There are 93 classes (including 4 dance classes and 9 special education classes) and 2386 children in this school. The average number of classes in each grade is approximately 15 to 16, with30 children in one class. Moreover, dance classes are a feature of school C from the third to sixth grades, and children need to pass an examination in order to enter the dance class.

In addition, school C normally has one teacher for each class of almost 30 children, which is typical for most primary schools in Taiwan. Although this school did not participate in the policy of FI, it still participates in many different activities and competitions. The climate on campus is usually friendly, but it is sometimes more serious than in school A. Because of the size of the school, there are many clear schedules, teaching goals, and regular examinations requiring coordination from the

teachers.

On the other hand, most parents of children in this school have high expectations and hope that teachers can help their children achieve good scores in every test and progress to junior high school in the future. This kind of expectation usually exists in the Chinese cultural society (as mentioned in Chapter III); it could also affect the education context in many different aspects, such as teaching methods and learning climate. Therefore, the teachers may have limited time and space to elaborate on the teaching plan as well as be less motivated to learn new teaching skills or methods because of the pressure from the school and parents. However, classes at school C could be present in most of the images of primary schools in Taiwan, which is why it was chosen as one of the cases for this research.

In this study, the main participants in school C are 29 children (9 years old) and 3 teachers (one tutor and two subject teachers) in a third grade class. There are 25 hours of video data from primary school C taken from 5 courses. The Chinese Language, Social Science, and Integrated Curriculum are tutors' courses and the Science course and the Art course are the subject teachers' courses. The children may display their PT in different ways based on different subjects and teachers' pedagogy.

Furthermore, three teachers were observed in the different courses. Teacher C is the tutor of the class and teaches Chinese Language, Social Sciences and the Integrated Curriculum. Teacher D teaches art and Teacher E teaches Science.

4.4. Data Collection

This study used multiple-case study as the research approach and it aims to obtain an in-depth understanding of children's PT and teacher's pedagogy in Taiwan's primary schools. According to the research objectives and the conceptual framework, a qualitative approach is appropriate for this research and there are four main methods for collecting the data. Firstly, there are the different research methods which are used in answering each research questions in this study (See the Table 4.1).

Table 4.1 The research questions and the research methods

Research Questions	Research methods (Data Collection)
1. Is there any evidence of PT in Taiwan's primary schools?	A. Documentary Analysis B. Classroom Observation C. VSR
2. How do children in Taiwan's primary schools use PT during the learning process?	A. Classroom Observation B. VSR
3. What is the nature of teachers' pedagogical practices in Taiwan's primary schools?	A. Classroom Observation B. VSR C. Interviews
4. What is the relationship between children's PT and teachers' pedagogy in Taiwan's primary schools?	A. Classroom Observation B. VSR
5. What factors and processes contribute to changing teachers' creative pedagogy and children's PT in Taiwan?	C. Classroom Observation D. VSR E. Interviews

The data for this research were collected by means of the qualitative data method and the related data collection techniques are described below.

1. Documentary Analysis

Evidence of the implementation of FI and relevant research or reports were collected

and subjected to a documentary analysis. This type of analysis has some advantages, including access to data and the permanence of the data (Denscombe, 1997; Creswell, 2009). It is also cost-effective, and provides researchers with an economic and fast way to gather a great deal of data at one time. Nonetheless, a documentary analysis still has some drawbacks, including doubt about the reality or credibility of the data and the fact that it is not original; therefore, the examination of this kind of data will be restricted to overcome these drawbacks and ensure the collected of good quality information.

In this study, documentary analysis is mainly used to obtain information about the theory of PT which was researched in the UK, but also mainly policies related to 'Future Imagination' by Taiwan's MOE. Such information helps to build a more in-depth contextual understanding of the research topics, and contribute to the construction of the conceptual framework and research design.

2. Observation

Observation enables researchers to examine the participants at first-hand and record situations as they occur. It is also a process of gathering open-ended information by observing people at the research site (Creswell, 2011, p.213). Furthermore, unusual aspects can be noted during observation, and it is also useful for exploring topics that may be uncomfortable to discuss (Creswell, 2009, p.179). Other advantages of observation include the opportunity to study actual behaviour, the ability to systematically collect direct data, and the assurance that the data collected is highly reliable and of good quality (Denscombe, 1997; Simons, 2009; Creswell, 2011). Shortcomings include only being able to observe behaviour rather than intentions, and researchers may find it difficult to develop a rapport with individuals or over-simplify

complex contexts.

As suggested by Denscombe (1997), field notes and personal reflections based on various aspects will be made in this study in order to obtain in-depth information from the observation. Therefore, more attention will be paid to recording students' behaviour at a given point in time. Furthermore, the contextual settings will also be analysed in this research.

Classroom observation is the main method for collecting data on children's learning experiences and teacher's pedagogical practices. During the observation, each session was recorded on video cameras which produced a full record of observations for subsequent analysis. At the same time, notes of interactions which appeared to relate to children's PT or teacher's pedagogy were taken. (See the Appendix 2, Page 355)

3. Interviews

Interviews are a method for gathering in-depth information from the interviewees. Creswell (2009) maintains that interviews are a useful way to gather information when the participants cannot be observed directly. Moreover, the interviewees can sometimes provide historical information, such as their personal experience. The researcher can maintain control over the line of questioning and obtain accurate information with a high response rate (Denscombe, 1997; Creswell, 2009).

In order to acquire a more detailed and in-depth understanding of the phenomenon of PT and the kind of pedagogy chosen and used in Taiwan's primary schools, the teachers in the three cases will be subjected to a short interview with the aims of obtaining more information about the children's behaviour and why the teachers used

a particular pedagogical practice during their teaching.

4. Video-stimulated review (VSR)

Based on previous research of PT, VSR is a powerful tool for educational research and can provide a clear reflection of learning (Zellermaye r& Ronn, 1999; Walker, 2002; Burnard et al., 2006). This method enables teachers to become involved in the project and activity and gives them the opportunity to view, discuss and analyse their pedagogical practice.

The use of VSR enables the collection of important data that the researcher might miss during the observation and by using the hand-written notes. In this study, the VSR method is used to analyze the data of children's PT behaviour and also the teacher's pedagogy applied during the courses.

Researchers can obtain various types of data and more in-depth information by utilising different methods of data collection (see Table 4.2) and the use of a variety of data in this case study will enable the researcher to construct a clear model and recognise some specific features of PT, as well as the relationship between PT and the pedagogy used in Taiwan's education system.

Table 4.2 Forms of Qualitative Data Collection

Forms of Data Collection	Type of Data	Definition of Type of Data
Documents	Hand-recorded notes about documents	Public and private records made by the researcher or someone else
Observations	Field notes and drawings	Unstructured textual data and pictures taken by the researcher during the observation
Interviews	Transcripts of response to open-ended questions	Unstructured textual data obtained from transcribing audiotapes of interviews
Audio-visual materials	Pictures, photographs, videotapes	Audio-visual materials consisting of images or sounds of people or places recorded by the researcher

Source: Creswell, J. W. (2011). Educational Research: planning, conduction, and evaluating quantitative and qualitative research (4th ed.), p214, Boston: Pearson Publications, Inc.

4.5. Design of Pilot Study

4.5.1. Introduction

A pilot study is a mini-version of a large-scale study. It can also be a trial run to help to prepare the formal study. The Concise Oxford Thesaurus defines a pilot study as an experimental, exploratory, test, preliminary, trial or try out investigation (Waite, 2002). A pilot study can also help to avoid a potential unsuccessful result of a large-scale study, which may defeat the whole effort. In addition, a pilot study can provide more information for the researcher to understand how well the research treatments and methods will work in practice (Blaxter, Hughes & Tight, 2010). In addition, pilot studies are conducted for several reasons, the most important of which is to receive information about the relevant field questions and the logistics of the field inquiry (Yin, 2009) based on which the research techniques or methods can be adapted and modified if necessary.

Therefore, since the aim of this research is to observe the concept of 'PT' in a primary school, the main reason for conducting a pilot study was to test the data collection method of a video-stimulated review (VSR) and the data analysis in order to make any necessary changes before undertaking the formal study. Thus, the pilot study for this research was not only a 'feasibility' study, but also a pre-test of the data collection and analysis.

4.5.2. Research Questions and Research Design of Pilot Study

The aim of the research is to explore the constituents of 'PT' in the learning experience of students, and how teachers foster students' PT as an aspect of creativity during the learning process in the primary schools. Since the pilot study was expected to help to test the methods and procedures that would be used in the formal study, it contained the following two research questions;

(1) Do primary students use possibility thinking during their learning in class?

(2) Are the research methods and procedures suitable for application to the formal study of the primary school in Taiwan?

Since this pilot study was to be a small version of the main research, it followed the design phase and adopted the same ethical issues as the formal study. A mini single-case study design was employed to investigate the above questions. The target participants in the pilot study were3studentsaged 11 (5th grade) from one class in the primary school in Taiwan. A qualitative method of data collection, namely, 4 hours of

classroom observation (two subjects), was utilised in this pilot research. The observed subjects in the pilot study were the 'Chinese Language' or 'Science'. This 4-hour classroom observation focused on the interaction between the teacher and the students during their learning process or learning activities. A video camera was used to record the entire observation and the researcher also made notes to record the students' behaviour at a given point in time. After the classroom observation, the VSR method was used to view, discuss and analyse the children's PT behaviour and the teacher's teaching pedagogy.

According to the results of the pilot study, the children's PT existed and could be observed and analysed using the research design approach. However, two issues were highlighted that could help to improve the design of the data collection, the first of which is a common problem when using a digital video machine, namely, that it may cause disruption and reactivity in an educational setting. The students may detect that they are being observed and may change their learning behaviour as a result. Because I am someone they had not seen before, the data showed that the children seemed to be a little bit nervous and quiet because I was sitting behind them and using a camera to record their actions. This may mean that the data did not show their real learning actions. Based on this finding from the pilot study, I decided to attend the observed classes for 2 weeks before the main research begins, but rather than conducting any research, I was like any other teacher to become closer to the participants. This preparation period was useful for understanding the climate and timetable of the school and the class, but did not interrupt the teaching activities.

The second refection is related to the settings for the video recording of the classroom observation. Only one camera was used for the video recording in the pilot study and I

found it was difficult to catch some of the interaction or conversation when the children were engaged in group activities, such as experiments, which limited the analysis. Therefore, in order to obtain every angle of the observation, but avoid further interruption during the courses, I decided to place two voice-recorders between the groups in the formal study and also make the notes of the interaction or conversation immediately when I recognised some evidence.

In short, this pilot study was indeed necessary and proved to be very useful for improving the main research design. Some details of the observation needed more attention and this was a good way of preparing the setting of the data collection in the main research.

4.6. Data Analysis

A deductive-inductive analytical approach is adopted for this study in order to 'ground' and 'support' the theory. The conceptual framework in Figure 3.11(Page 108), which was designed by the main PT theory and creative pedagogy in previous studies is adopted to find evidence of what 'PT' in Taiwanese children might mean, and most importantly, what it might look like. The existing PT documentation framework (Table 3.1, Page 77) consisting of three sets of ideas involved in PT and associated with the process, the outcome, and both the process and outcome are also utilised in this study.

Based on the research design and data collection, two main layers of analysis are used to test or modify Craft's (2002) PT theoretical model in Taiwan's education, the first of which draws on the VSR data of classroom observation. The VSR sessions are

expected to highlight the significance of an environment full of rich resources and the knowledge of the children's context and interest in the classroom (Burnard et al., 2006). The data obtained by using the VSR to record the complete teaching and learning between the teacher and the children were expected to include details of the children's verbal and non-verbal behaviour in terms of asking and answering questions and the teacher's recomposed or leading questions. It also included the interaction between the teacher and the children during the courses.

Notes (See Appendix 2, Page 355) and transcripts were be made of the dialogue or discussion about posing questions or solving problems (lesson tasks) related to the concept of PT and the teacher's pedagogy between the teacher and children or in the group discussion. The VSR data were used to find evidence of the learning and pedagogy of PT. Moreover, the short interviews with the teachers in this study were useful for analysing information and evidence of the children's PT behaviour and the reason for using this kind of pedagogical practice in the teaching activities.

The second layer of analysis entailed the recording of events during three minutes of classroom observation. Although there may be one or more events or activities in one lesson, some important events for one group (3-6 children) was chosen and detailed transcripts were made based on their interaction during these events. The recording of the events lasted for three minutes and include verbal and non-verbal behaviour and the transcripts were coded using NVivo software to categorise the evidence of the children's PT behaviour and the pedagogy used by the teacher.

4.7. Verification

Field research is likely to be more valid than surveys and experiments, because 'being there' is a powerful technique for acquiring an in-depth insight into the nature of human affairs in all its rich complexity (Babbie, 2007). However, some may argue that case studies provide little basis for scientific generalisation because of the use of a small number of subjects; therefore, since the validity of a field study does not carry the same weight as quantitative research, nor is it associated with reliability or generalisability (Creswell, 2009), the research should focus on expanding and generalising existing theories rather than enumerating the frequency of the data, and one way to achieve this is to triangulate the case study with other data collection methods.

In order to ensure the validity of the accuracy of the research findings, the following strategies were adopted in this study (Creswell, 2009):

1. Triangulating different sources of information: The researcher examined the evidence from the VSR observation and the transcripts of the 3-minute events and interviews and used it to build and develop coherent justifications and a conceptual framework by analysing it.
2. Using member-checking to determine the accuracy of the research finding: The supervisor helped the researcher to confirm the evidences of PT in the data. There will be many discussions and clarifications before the final report.
3. Using rich, thick descriptions to convey the findings: There were many detailed descriptions and information of how to classify the evidence from different sources, how to define the evidence and how to develop the final PT conceptual model in Taiwan's education.

4. Clarifying the bias the researcher brings to the study: Self-reflection was applied during the process of the data analysis. The researcher created an open and honest narrative toward the study and present the findings truthfully.

5. Spending a long time in the field: The researcher spent over four months in the field and tried to acquire an in-depth understanding of the phenomenon being studied. This helps to convey more details and develop better research findings.

I was very cautious in every step of the research procedure and always be critical and objective when understanding and explaining the phenomenon being studied in order to obtain the greatest validity for this research.

4.8. Ethical Issues

Ethical issues are particularly significant in the planning stage of the research. Researchers need to protect their participants, develop a relationship of trust with them, and guard their organisations or institutions from misconduct and impropriety (Creswell, 2009). The ethical guidelines for educational research produced by the British Education Research Association (2011) also indicate that researchers are responsible for protecting their participants by ensuring their confidentiality and anonymity, and advising them of their right to withdraw from the research at any time or for any reason. Researchers need to ensure that the participants are well informed about the purpose of the research and give their written consent to participate in it. The participants also need to be advised of the risks they may face and the benefits they may accrue by participating in the study. Moreover, all the participants have the right and should feel free to make an independent decision without fear of negative consequences.

Thus, the six key principles of ethical research based on the Economic and Social Research Council (ESRC) in 2012 (ESRC, 2012) was adopted in this study.

1. **Research should be designed, reviewed and undertaken to ensure integrity, quality and transparency.**

   The researcher collected the relevant documents or reports that underpin the implementation of 'Future Imagination (FI)' in order to ensure the quality of the research and acquire a PT, which led to a deeper understanding of the way in which creative education can be developed in the UK and Taiwan based on the concept of PT.

2. **Research staff and participants must be fully informed of the purpose, methods and intended possible uses of the research, what their participation in the research entails and what risks, if any, are involved.**

   It was necessary to seek permission to undertake this research from the head teacher of the primary school in Taiwan. The head teacher also received a written consent form, which included all the detailed information of the research. After receiving the head teacher's formal written consent, the class teachers were contacted verbally and invited to participate in an informal face to face discussion to explain the purpose, process and time commitment of this project. Formal written consent was sought from the class teachers, who made aware that they can opt out of the research at any point without having to explain their action.

   Undertaking research with children necessitates obtaining their parents' informed consent; therefore, access to the children needed to be negotiated with parents and families. The parents of the participating children were contacted via a letter

informing them that the research is being conducted to improve creative teaching and learning in Taiwan's education system and a formal presentation was made explaining the research project. The parents were advised that they have the right to approve or refuse their children's participation in the research. In this way, both the teachers and parents will have a clear understanding of the activities, video-recorded observations and interviews used in this research. Moreover, they will be advised that the data were collected as part of the school's normal routine.

Informed consent must be obtained from all the participating students. In order to ensure that the participants are fully aware of their rights and have some understanding of the context and purpose of the study, they were given written information before the research process begins so that they became involved on a voluntary basis. They were also assured that they can withdraw at any time without having to give a reason for their withdrawal.

3. The information supplied by research participants must be kept confidential and their anonymity must be respected.

Confidentiality meant that researchers were obliged to protect their participants' identity, as well as the place and the location of the research (Silverman, 2011). All the participants in this study were assured that the information they provide was kept confidential and their anonymity was protected at every stage of the study and that the data were stored securely. The issues around safeguarding and protection that may arise during the research process also need to be explained to the children before the beginning of the research in terms they can understand. This particularly relates to the fact that the video and photographs for the data collection only were used for observation purposes and only were viewed by the

researcher and the class teachers. Furthermore, the data were securely stored and the participants were given pseudonyms in the reporting process.

4. Participation in research must be entirely voluntary and free of coercion

The self-determination of participants was also very important during the research process. All the participants have the right to determine their own participation in the research, including the right to refuse to participate without negative consequences (Hennink, Hutter and Bailey, 2011, p.63). Thus, the participants in this study were made aware of their right to refuse to participate for whatever reason at any point and to withdraw from the research at any time. In this case, the video material related to the participant were destroyed and not used in the research.

5. Harm to research participants and researchers must be avoided at all times

I was sure to avoid harming the students or teachers during the whole research process. When researchers become aware that any research procedures or treatments have harmed a participant, they should take reasonable steps to minimise the harm. Moreover, when designing and operating the data collection methods, care must be taken to ensure minimum stress and disruption and the maximum care of the participants. In addition, the researcher should not only minimise any physical harm, but also avoid mentally harming the participants (Hennink, Hutter and Bailey, 2011). For example, I avoided shaming or embarrassing the participants, which was likely to cause them social harm because of the way in which they were viewed or treated by others in their community.

6. **The independence of the research must be clarified and any conflict of interest or partiality must be explicit.**

The study must be independent and impartial, not only in terms of the data collection but also the data analysis. The purpose of this study was very clear and the findings only were used to understand how students use PT during their learning process at a primary education level and to provide some suggestions to enhance teachers' professional development in order to foster students' creativity in the future.

In conclusion, when conducting this research, I adopted the principles outlined above and provided the school, the teachers, and the participants with full information about the research. The informed consent forms can also be found in Appendix 1 (Page 352).

4.9. Potential Problems and Limitations

This section was constructed before the main study in order to reduce the likelihood of problems and limitations during the research. The plan entailed the use of video recordings for the classroom observations to capture verbal or non-verbal (body) language and provide a permanent record for a further analysis in the future. This is because it is difficult to fully record the entire interaction in classroom teaching and learning using notes and video a recording also provides the chance to rewind if some important information is missed during the transcription. However, the use of a digital video machine may cause disruption and reactivity in an educational setting. Students may detect that they are being observed and change their learning behaviour as a result. In order to minimise this influence, two cameras were positioned in the classroom, one of which was placed in a corner to avoid attracting students' attention.

In this way, students were expected to feel more comfortable when I began to observe and recorded their behaviour.

Another potential difficulty is the reality of the data which means that the data could present the real situation in the context. In order to receive the real and in-depth data for children's learning activities in Taiwan's primary schools, non-participant observation was used to access the real teaching and learning interactions between the teacher and the students in this study. Therefore, one week before the observation, the researcher entered the field and sat in the classroom with the teacher and children. The aim of this approach was to build trust and acquire an understanding of the participants before the definitive observation.

In addition, a small-scale interview was conducted with the class teachers in each case so that they could share their in-depth knowledge of the students and their previous experience of teaching them, and provided more detailed and real information for the observation in the project.

4.10 Conclusion

The methodology used to complete this study has been outlined in this chapter. The aims and research questions (also the sub-research questions) indicate that this study focuses on the relationship between children's PT and teachers' TP in Taiwan's primary schools. In addition, to explore what constitutes PT in children's learning experiences, the main topic of this study, the analysis of the ontology, epistemology, and methodology was discussed. This study may be based on the two paradigms of

post-positivism and constructivism, and the methodology also provided the reasons for why I chose a case study design. The research procedure, timetable, and introduction of the three participating cases were described. In addition, the findings of the small-scale pilot study were summarised in this chapter. The data collection, data analysis, and verification were discussed in addition to ethical issues. The final part of this chapter pointed out the potential problems and limitations of this study.

In Chapters V and VI, I will present the evidence of PT (in Chapter V) and pedagogy (in Chapter VI) generated from the analysis of multiple cases in Taiwan's three primary schools.

Chapter V

Children's Possibility Thinking in the three schools

The results of the first part of this study, which is based on an examination of the PT of children in three primary schools in Taiwan, are presented in this chapter. The chapter is divided into two parts, the first of which contains a brief description of the research findings of the PT level of the children in the three case study schools. What the children's PT showed in the three different cases is illustrated in the second part based on eleven features of a PT model used in previous studies in the UK context.

5.1 Introduction

According to research based on an investigation of children's PT at stage 3 (9-11 year-olds) in UK primary schools (Craft et. al., 2012), there are 11 evidence-based features of PT, namely, question-posing (Q-P), question-responding(Q-R), immersion, being imaginative, play, innovation, risk-taking, self-determination, development, intentional action and peer collaboration. Therefore, the aim of this study is to identify the way in which children use and perform their PT in the Taiwanese education system. Evidence of each PT feature identified in the data is presented in the analysis below. As described in my methodology (Chapter IV), individual children bring a wide range of learning experiences to the classroom. However, it was beyond the scope of my research, to do a close analysis of how individual experience and background differentially impacts upon PT in the classroom. The focus of my research is on the relationship between children's demonstration of PT in the Taiwan's primary classes and teachers' pedagogy, particularly in light of the fact that the dominant pedagogy is changing in Taiwan to one which allows for more creative

thinking and imagination in the curriculum. It is here that my research will make the most important contribution and potentially lead to future research which can in turn look at specific groups of children and their experience in school. This would further invoke the need to consider the impact of the home environment and cultural practices as well as social and economic factors too.

Based on the transcripts of the data from the three schools, the evidence of a talented class in school B reveals that the children in this class produced twice or three times as much dialogue or verbal behaviour as those in the other two primary classes (school A and school B). Since there were only about7-10 children in Class B, they had more opportunities to ask questions or propose ideas during the teaching and learning context than those in the other classes. The small class size may have been a contributing factor of the children in the talented class having more confidence and being more motivated to engage with the activities or solve the problems posed by the teacher or the task.

The findings from School A (primary class) and School B (talented class), both of which participated in the Taiwanese Government 'Future Imagination (FI)' policy, illustrated the way in which the children in these two classes performed their PT during their learning. The pedagogy of the teachers may also have influenced the children's PT in these two cases because they had received the relevant training related to creativity.

On the other hand, the third school, School C, was a primary school which did not follow the FI policy at that time. Since the teachers in this class did not understand FI, they adopted the pedagogy that is commonly applied in the Taiwanese education

system. Therefore, this case can be said to represent the PT of most children who are educated in Taiwan without any creative education policy being implemented.

Moreover, the children in school C (primary class) were only 9 years old, which was younger than those in the other two schools; therefore, this provided a good opportunity to study the PT of children in the middle grade in Taiwanese primary schools. Evidence of the children's PT found when observing the three classes in my study is provided below.

5.2 Children's Possibility Thinking in three primary schools in Taiwan

The first study of PT conducted by Burnard et al. (2006) was broadened by Craft et al. (2012), who considered the PT of older primary children aged 9-11 (Stage 3 in UK education). The role of children's questioning behaviour was highlighted in this study and further strong evidence was produced of other PT features that corresponded with those in the first study.

However, it was indicated in the literature review that the characteristic of 'risk-taking' that was absent in the previous UK study of children at stage 2 (Burnard et al., 2006) existed at stage 3 (Craft et al., 2012) and a new PT feature called 'peer collaboration' was also identified in children aged 9-11 (Craft et al., 2012). Therefore, one aim of my study was to understand if this was a different PT feature of children of different ages in Taiwanese primary schools. The analyses sections below follow the PT model (children aged 9-11) proposed by Craft et al. in 2012 and the eleven features of children's PT are divided into three circles, namely, 'Process', 'Process and Outcome' and 'Outcome'. The overall circle is 'Peer Collaboration', which includes the circles of process, process and outcome, and outcome (see figure 3.6, Page 86). Therefore,

evidence of these eleven PT features, which are question-posing (Q-P), question-responding (Q-R), immersion, being imaginative, play, innovation, risk-taking, self-determination, development, intentional action and peer collaboration, is analysed in this study.

Drawing on the conceptual framework which was constructed from the literature review and previous research on PT in the UK, the data from the classroom observation collected in this study was video-recorded and analysed. Firstly, from my reading of UK studies such as Craft et al (2012) I developed a clear and in-depth understanding of what children's PT might look like in practice, and also how to find evidence of PT in the data. Secondly, the notes which I made during fieldwork helped to review the evidence and code the data. Thirdly, this study used non-participant observation so that as the researcher/observer I could stand in an objective position to observe all the interactions between children and teacher during the teaching activities.

Through a detailed and iterative process of reading observation notes and watching video recordings the data was coded around key emergent themes. Triangulation of data analysis was used in this study between data methods, particularly observation notes, and use of video recall. This further confirmed the reliability and validity of my interpretation of the data. The strength of gathering video-recorded data in this study is that I could playback the video for reviewing the codes at any time

The following sections describe how the evidence of children's PT which were found in the three cases.

5.2.1. 'Process' of PT -Question-Posing (Q-P) and Question-Responding (Q-R)

The Q-P and Q-R analysis focused on the children's questions, both verbal and non-verbal, and even their responses to questions. This analysis not only revealed how the children posed or asked questions, but also the kind of questions the teacher asked them to enhance their interest in asking questions during the class.

(1) Children in School A (aged 12, primary class, Joined FI policy)

It is evident from the collected data that the children in School A asked a wide range of questions during three classes, namely, Science, Chinese language, and Integrated Curriculum subjects. They first raised their hands and then asked their questions. It seems that these children had more ideas and were more willing to speak out when the class activities or topics were flexible and creative.

For example, the content of the Chinese Language class related to protecting the environment. When the teacher mentioned that some bad people used electricity illegally to kill and catch fish in nature reserves, Jimmy raised his hand and asked 'Why do they use electricity for fishing?' The other children were also interested and expressed their confusion about this issue.

> [A-T1-CH02-0021-0700]
> > *Teacher A-1 mentioned that some fishing methods were bad and illegal, and they should not be used because they harm the environment.* <
> S_Jimmy: Why do they use electricity for fishing?
> S Other children: Why…?

Moreover, in another discussion about Alice's Adventures in Wonderland, the teacher asked the children if they would like to follow the rabbit. The children were all quiet

and it was clear that they were thinking about this question. This indicated that they may have needed some time to think about the question or develop their answers. Then, they raised their hands and began to express their ideas and ask some questions about aspects they found confusing; however, some of the questions seemed to be very imaginative. These kinds of questions demonstrated that the children were able to express their doubts by discussing them with other children, but they also used their imagination to address these topics or issues.

> [A-T1-CH02-0021-0700]
> Teacher A-1: Who wants to follow the rabbit into the wonderland? Please raise your hand if you want to go with him.
> (Quiet… No response...)
> Teacher A-1: Don't you have the courage for an adventure?
> (2 seconds later)
> S_Mary: Is it a wild rabbit? We might be eaten by a wild rabbit or dogs when we become small.
> S_Tracy: Is it possible that ants might eat us when we are very small?

In addition, the children asked questions when they thought something might be wrong or they identified a possible problem with the content of the lessons, and in these cases, the teachers sometimes did not provide the correct answer directly. They asked the children to explain why they thought there was a problem and what they thought the answer might be. This appeared to support children to learn to judge and determine right and wrong answers to classroom questions, but also to practice their problem-solving ability.

Some of the questions posed by children were very imaginative; for example, the teacher provided a writing topic entitled 'To visit the future' and asked the children to complete a 500-word essay. Some of the children asked questions that were beyond

their experience, but they were interesting and imaginative.

[A-T1-IC04-0059-0600]
> Teacher A-1 presented the topic of writing work -'To visit the future 'and asked for a 500-wordwritten essay. <
S_Jimmy: Teacher, I have a question. Will people eat soil in the future?
Teacher A-1: Why you think they would eat soil?
(Jimmy started to explain why he thought that people might eat soil in the future)

In the Taiwanese education system, children are often reluctant to ask a question if they are not sure or they think it may be risky, which may be a result of Chinese culture, as will be discussed in a later chapter (Chapter VII). Therefore, it was good that the teachers encouraged the children to ask questions and led them to think or find the answers themselves. It was also found that the frequency of the PT features of 'Q-P' and 'Q-R' in the children was not very high in the classroom activities in the two primary classes in this study (See Table 5.1), since the data showed that most of the children in Taiwanese primary classes remain quiet when they are not sure of the correct answer.

[A-T1-CH03-0023-1148]
S_Jimmy: Is this word the same as 'oversee'?
Teacher A-1: Do you think these two words are the same? Why do you think that?
S_Jimmy: I think they are different.
(Teacher A-1 continued to ask questions to help the children to express their ideas)

[A-T1-IC02-0049-1200]
> Teacher A-1 played a video of some news. The news was that some people were buying air-driven generators for their homes in order to save electricity. <

(After watching the video, one child raised her hand)
S Alice: There might be a problem if a typhoon comes in the summer. Isn't that right?
Teacher A-1: What kind of problem do you think might happen?

Although the children in this class appeared to be happy to ask the teacher questions, they rarely questioned each other during these learning activities. This may be the result of the teacher's curriculum design or teaching methods. In Taiwan's primary education system, teachers usually expect children to complete their tasks or work by themselves, such as writing an essay, drawing, or producing a concept practice sheet. However, children still sometimes question classmates sitting near them because they are interested in the progress other children are making or whether the answer is right or wrong.

[A-T1-IC04-0060-0230]
>*The children continued to complete their essay, but there were some interaction between children and their near classmates to discuss or have a short talk about their essay.* <
S Ted asked Mary: What did you write?
(Then, Mary whispered her idea to Ted)

Furthermore, the teacher sometimes tasked the children with the mission of providing a question in the class and then asked the other children to answer it. The children seemed to be interested and highly motivated to raise their hand because they hoped they could pose their question to the class.

[A-T2-SC02-0025-0050]
Teacher A-2: Who can set a question related to textbook pages 35-41?
(S_Cindy raised her hand)
Teacher A-2: OK, Cindy.

S_Cindy: Talc and Quartz; which one of the hardness is stronger than the other one?
S Other children: Quartz.
Teacher A-2: Good. Who can provide the next question? (S_ Johnny raised his hand)
Teacher A-2: Yes, Johnny.
S_ Johnny: What do you feel when you touch the talc and the quartz?
S Other children: Talc is smoother than quartz.

In the observations of school A, the teachers used a lot of questions during their teaching; therefore, the data contained a substantial amount of evidence related to children's question-responding (Q-R). The children in the class of school A were highly motivated to answer the questions because the teachers usually provided an open and supportive environment and also encouraged them to express their ideas or thoughts because there could be a correct answer to the question the teacher posed. In fact, most of the evidence showed that the children usually gave the correct answer to the teachers' questions, but the teachers did not generally announce the correct answer. Rather, they followed up the children's answer by asking more questions in order to lead the children to think and check the reasoning behind the answer.

[A-T2-SC01-0018-1230]
> The first experiment in the class started. Teacher A-2 showed two racks, one of Talc and one of Quartz. <
Teacher A-2: I am sorry that I put the talc and the quartz together. I need your help to find which one is talc and which one is quartz. Each group will have 1 minute to observe these two rocks and then you will have 3 minutes for a discussion. After the discussion, please tell me your answer.
(After the experiment and discussion, teacher A-2 was back on the stage)
Teacher A-2: Okay, now, who can tell me what these two rocks are?
S_John: (pointing out one rock) This is quartz and that one is talc.
Teacher A-2: Could you tell me why you think this is quartz and that is talc? What is the basis of your decision?
S_ John: Because it could be ground; there is some power when I grind this

rock.
Other children: Talc is smoother than quartz.

In another lesson, the teacher posed many leading questions so that the children had to consider them more carefully to give a correct or appropriate answer. It was also good that the teacher used more open instead of closed questions to improve the children's ability to think, which meant asking 'what?' and 'why?' questions to encourage the children to think more deeply and try to find answers themselves.

[A-T2-SC01-0018-0414]
> After the discussion and explanation about the difference between river erosion and soil accumulation. <
Teacher A-2: We could have a new example. What do you need to notice when you are riding a bike on the inner side or narrow side of the road?
S_Anne: We need to slow down.
Teacher A-2: Why do we need to slow down?
S_Anne: Because we might fall down or bump into somebody if we do not slow down.
(Then teacher A-2 continued to use this example and asked more questions to make a connection with river erosion and soil accumulation)

[A-T2-SC02-0027-0210]
Teacher A-2: Now I want to extend a question that relates to the video we watched. You could see that the factory was discharging waste water into the river. What kind of pollution and problems will this cause?
S: River pollution. (Many children responded at the same time)
S_Alex: The fish in the river will die.
Teacher A-2: Has anyone any more ideas about that?

These examples show that the children did not only answer the questions, but also thought about their answers. It also indicates that the teachers used a lot of questions beginning with 'Why do you think….' or 'Are you sure….' to encourage the children to give clear reasons for the questions they posed. In addition, if the children gave a

wrong answer, the teachers did not correct them immediately; rather, they asked more questions to help them to find the right answer.

In addition to providing the correct answers to closed questions, the children were often able to provide a variety of answers for more open ones. This means that they did not just answer 'Yes' or 'No', but tried to propose other ideas that corresponded to the topic or questions.

> [A-T-IC04-0060-0510]
> Teacher A-1: Let us imagine the future, maybe 300 years later. Do you think there will still be a lot of road signs?
> S_Jack: No, I don't think so.
> Teacher A-1: wow~ you think there will not be any road signs in the future. Why?
> S_Jack: I think the cars will have automatic navigation, and they won't need a driver.
> (Kent raised his hand and wanted to speak)
> Teacher A-1: Yes, Kent.
> S_Kent: I agree with Jack because I think humans will have navigation inside our body and we will not get lost.

In this example, the teacher provided the children with space to use their imagination. She also used more questions to encourage them to express their thoughts and explain why they thought in this way. This showed that providing space for imagination and asking more questions increased the children's interest or motivation to try to answer the questions during class. Moreover, evidence of the impact of Teachers' Pedagogy (TP) on the children's PT will also be provided and discussed in Chapters VI and VII.

The evidence of children in school A's 'question-posing' and 'question-responding' indicates that there were no significant differences between subjects. This may have

been because the two teachers in school A were especially interested in enhancing the children's reflective thinking. Hence, they both asked a great many questions during their lessons and tried to encourage the children to produce more interesting thoughts or ideas. Therefore, another issue that needs to be emphasised is the type of questions posed by teachers. Do teachers' questions enhance children's PT? If so, what kind of questions? Does teachers' pedagogical practice influence children's PT? This will be discussed in the next chapter.

(2) Children in School B (aged 11, talented class, Joined FI policy)

The observation data from school B shows that the children in the talented class appeared to be highly motivated to participate in the activities. It is clear from the evidence shown below that the children were highly engaged in answering the teacher's questions during the class and they used their own words or gave examples to clarify their explanation when responding to questions.

[B-T2-LN02-0004-1900]
> *Teacher B reads a paragraph from a power point.* <
Teacher B: So, what does it mean?
S_Tim: It means we should pay attention…. (Started to give a clear explanation in his own words)
Teacher B: Very good. Thanks to Tim for speaking… (The teacher gave another two examples to enhance the children's understanding of this point)

[B-T2-IRB03-0044-0001]
> *Teacher B posed the research topic-'polar climate'.* <
Teacher B: So, do you think this topic is important or not?
S_Fiona: Yes, I think it is very important.
Teacher B: Why you think it's important.
S_Fiona: Because now we have a very serious problem of global warming...
Teacher B: Good. So we could try to think…. (The teacher continued to explain the meaning and importance of the topic and then used an example

to teach the students to study this topic)

[B-T2-IRA02-0042-0600]
> *Teacher B allowed the children to share their answers to the research questions on the worksheet.* <
Teacher B: Please remember you need to say WHY you chose this research method.
S_Danny: I think we could use a documentary analysis and an experiment to answer the third research question, because….. (He began to give his reasons for choosing these two methods), and… I want to use a 'design a multi-functional folder' as an example. First, I will collect the related information, research or the results of surveys about the kinds of folder people would choose to buy...then….

The data also showed that the children liked to answer or ask questions to express their ideas or confusion during the lessons.

[B-T2-LN01-0002-0120]
Teacher B: We will hold a debate competition before the end of this term. We might have 4 people in each team.
S_Tim: Teacher, we are 9 people. What about the one who is left?
Teacher B: Well… we could see if one of you could be the host or….
S_Alex: Or teacher could join one of the teams and then we are 10 people, 5 in each side.
Teacher B: That sounds like a good idea, but it might be not very fair if I join in. Don't worry, we will have more discussions before the competition.

The great diversity of the curriculum in the talented class meant that the children could learn different kinds of knowledge that they may not have obtained in their original primary class (the talented class is not an individual class in Taiwanese primary schools; please see page 131 for a description). For example, "debate" is a new topic in primary school. Most of the children had no experience of debating before and this was the first time they could participate in a debate competition.

Therefore, they were very interested in the preparation for the competition, such as learning the rules and collecting the resources. Because they hoped that they could learn the rules and start to prepare for the competition, the children were very focused on the topics the teacher provided during the lesson and asked questions immediately in the class to acquire a deep understanding of the various topics.

[B-T2-LN01-0002-0355]

> Teacher B and the students discussed the topic "the rules for presentation in the debate competition". <

Teacher B: Now we understand the rules for the presentations in the competition- "5 minutes, 5 minutes, and 4 minutes" and there will be a 5-minute break. Could you tell me how much time will be spent in one debate competition?

>Very quiet. The children were focused on finding and calculating the answer. Teacher B stood back and gave them time to solve the problem. <

Teacher B: You could read the work sheet. It contains the information and the rules for the presentation. You could review it.

S_Ray: 29 minutes?

S_John: 29 minutes…

S_Tim: Teacher….the constructive speech and cross-examination are both 5 minutes, right?

S_Tina: Is it "5 minutes, 5 minutes, 4 minutes"?

S_Ben: So, it is not the rule of "4 minutes, 4 minutes, and 3 minutes"? (He pointed at other rules of presentation in the worksheet) We need to use the rule "5 minutes, 5 minutes, and 4 minutes" to calculate, don't we?

Teacher B: Yes, "5 minutes, 5 minutes, 4 minutes" is the typical and traditional rule for the presentation in a debate competition.

S_Ben: Will two teams propose the conclusion together?

Teacher B: I don't think they can propose together.

S_John: So each team has 4 minutes to reach a conclusion.

Teacher B: So…. how much time will be spent on one debate competition?

S_Ray: 69 minutes.

[B-T2-LN01-0002-1802]

>S_Ray raised his hand for permission to speak. Then, S_Alex also raised

his hand. Teacher B let S_Ray speak. <
S_Ray: What is the purpose of those 5 minutes' rest time?
S_Alex: It just means that we can take a rest.
Teacher B: Well, you can use those 5 minutes any way you like, maybe go to the washroom, get a sandwich, or do some exercise…..

In the talented class, the children not only posed questions to the teacher. They also tried to resolve their confusion by addressing their question to the child who was speaking. For example, the children sometimes asked each other questions, such as 'Does it work?''Is it possible?' during the lessons when they had different points of view. They were also observed to use questions and answer questions to check possible solutions or provide different arguments. This kind of behaviour represented the performance of the children's PT in the classroom. However, in order to prevent an argument between two children, the teacher commented on both of their viewpoints and reaffirmed that people should respect others' points of view, even when they differed significantly from their own. Although this was a good chance for the children to practice their critical thinking, the teacher needed to pay more attention to handling the situation and told them that we should respect everyone's words and ideas, even if we disagree with them.

[B-T2-LN03-0037-1400]
>Teacher B provided an opportunity for the children to speak so that they could provide a solution for 'how can we reduce the crime rate' by using a green thinking hat. <
S_John: I think the government could build more gyms to solve this problem.
S_Tom: Would it be effective?
> Teacher B allowed S_John to continue to explain his idea to the class, but interrupted their discussion before the argument became heated. <

[B-T2-LN01-0002-1755]

>*One child mentioned that there might be different viewpoints in the same team, and he thought that this would not be fair in the competition.* <

Teacher B: Well, Tim has mentioned that it might be not fair if most of the members of the affirmative team have negative viewpoint …what do you think?

S_Andy: I don't think so.

Teacher B: Why?

S_Lisa: I think yes, because if most of them prefer the other side, they would not give a good argument for their team.

S_Andy: Is the person who has a different viewpoint not allowed to express different ideas?

Teacher B: Yes, he is, but this is team work, and members of the team on the same side should have a consensus during the discussion and negotiation within the team.

The evidence of the PT features of 'question-posing (Q-P)' and 'question-responding (Q-R)' in school B (talented class) indicates that the frequency of the children's behaviour was high in these two aspects. This may have been because they found the learning topics new and interesting. However, the teacher in the talented class also used many leading questions and gave the children sufficient time to express their ideas or make decisions, which may have enhanced their problem-solving ability by enabling them to practice it or have various perspectives of the learning topics. The case of school B is a good example of the way the children used Q-P and Q-R as a process to practice their PT during the lessons.

(3) Children in School C (aged 9, primary class, Not Joined FI policy)

In contrast to schools A and B, where the children frequently volunteered to answer the teachers' questions and also asked questions, the data from school C showed that the children's Q-P and Q-S were both of a low level. This means that the children usually just sat on their seats and listened to the teachers, and the teachers instructed

them to stay very quiet. Therefore, they had few opportunities to ask questions about the teaching topics because the teachers directly told them the answers. Sometimes, the teachers asked them some simple questions during the lessons to ensure that the children knew and understood the topic. This is a typical traditional teaching method in Taiwanese primary education, especially when children are young in the 1st-4th grades. Therefore, the level of question-responding (Q-S) behaviour was higher than that of question-posing (Q-P) in this case.

[C-T4-AR01-0084-0135]
> Teacher D gave the children their unfinished drawing picture and told them they should finish the main characters in their drawing. <
Teacher D: So, could you tell me what the main character in this product is?
Children: The building.

[C-T4-AR01-0084-0325]
Teacher D: Ok! Now, stop drawing. Look at me. Now, please look at your picture. Can you see the main character?
Children: Yes.
> Teacher D picked up one child's picture as an example and asked all the children to identify the main character in it, but rather than asking the child to explain his product, the teacher gave direct comments to the whole class. <

Since the teacher in this classroom asked very few open-ended questions, the children were more passive and listened to the information from the teacher or textbooks in courses, such as Chinese Language and Social Science. The teacher emphasised the main points or the principle knowledge the students should learn again and again in the lessons and sometimes asked them to repeat an important sentence.

However, it was clear that the children wanted to respond to questions spontaneously

in particular lessons or activities. For, example, they showed a great deal of interest in some small-scale experiments during the Science course, when there was a very lively atmosphere, and although the teacher needed to spend a great deal of time explaining the rules to prevent the occurrence of any accidents, the children were still very excited to be exploring new things. In addition, the teacher (T3, Science course) in school C usually asked a great many questions before the experiment in order to improve the children's thinking ability, but also to increase their curiosity and motivation. He used many open-ended questions during the entire activity, such as 'Can you guess what is inside?' 'Why can't you push this syringe down?' Since the children were more interested in the topic, they raised their hands to express their ideas or respond to the teacher's questions. They also expressed their confusion when they did not understand. Therefore, it could also be found that there was a subject difference for children's PT or teacher's pedagogy and the effect of this difference will be discussed in Chapter VII.

[C-T5-SC01-0102-0730]
> *Teacher E took out many syringes and then pointed to one of them.* <
Teacher E: What do you think is inside this syringe?
Children: Air!!!
Teacher E: Are you sure it is air inside this syringe?
Some children: Water…..
Teacher E: (taking another syringe filled with blue liquid) How about this one?
S_Alice: Water and water colour pigment.
S_Luis: Seawater.

[C-T5-SC01-0102-0950]
> *Teacher E wrote the questions on the blackboard.* <
Teacher E: The first question you need to answer in the experiment today is "Can the air be pushed in a syringe"
Some children: Yes! Maybe.

Some children: Maybe not.

[C-T5-SC01-0103-0350]
> *Teacher E asked the children put their hands on their knees and pay attention.* <
Teacher E: What did you find in this experiment? Please raise your hands if your syringe rebounded after you pushed it.
(All the children raised their hand)
Teacher E: Okay. So, could you tell me what you felt when the syringe rebounded?
S_Elsa: It was a bit painful.
S_Edward: It was very hard to push.

In the data of school C, question-posing (Q-P) behaviour was usually seen between the children or in the teamwork. The children liked to ask their classmates who were next to them or in front of them questions to acquire some ideas. The behaviour of question-posing (Q-P) and question-responding (Q-S) could be observed during the teamwork, because the children discussed problem solving with their partner and compared arguments to complete the task.

[C-T4-AR01-0085-1815]
> *It was time for the children to complete their product.* <
>*The children had some discussions individually.* <
S_Erine: (to S_Anna) What colour do you think is better for this flower?
S_Anna: Um… I don't know… maybe yellow? Or red.
S_Andrew: (to S_Tina) Could you lend me your blue crayon?

[C-T3-IC01-0082-1200]
> *It was time for the groups to complete their product.* <
>*Two children on one ground having discussion.* <
S_Lucy: (to S_Eileen, her partner) I think we could add one more picture in this corner, what do you think?
S_Eileen: Okay, I agree.
> *Another group.* <
S_Wendy: (to S_Alen, her partner) The teacher's comment is that we should

add more description for this topic. Do you have any more resources we could use?
S_Alen: (Looking for a newspaper in his bag) Let me see…I am not sure whether I brought the newspaper I found to school or not….wait…

[C-T3-IC01-0082-1540]
> *It was time for the groups to complete their product.* <
> *The children in this group cooperated well and had a lot of discussion but no real arguments.* <
S_Annie: (to S_Lin, her partner) I've finished cutting, so is it ok to put this picture here?
S_Lin: Yes, thank you. I am continuing to complete this paragraph, but I am a little stuck…
S_Annie: Really? Let me have a look… (Reads the words) um… do you think we could add some information about when people could visit this place?
S_Lucy: Do you mean the season? Or the daily opening time?
S_Annie: How about both? I think more information is good. What's your idea?
S_Lucy: Perfect, I agree with you. Let's do it.

The evidence gathered in school C showed a low level of the PT features of 'question-posing (Q-P)' and 'question-responding (Q-S)'. The level was also lower than in the other two cases, but it was influenced by different subjects or the teacher's pedagogical practice. Although the teacher usually asked these young children to stay quiet and just sit and follow her instructions in order to teach them important knowledge and skills, they sometimes expressed their ideas by asking questions or discussing some learning activities with their classmates if they were interested in them. This shows that children cooperate during the lessons in primary schools, which will be further discussed in a later section.

5.2.2. 'Process (Immersion) 'and 'Process and Outcome of PT (Play)'

Based on the PT model (Craft et al., 2012), the feature of 'immersion' is placed in the section of 'process', and 'play' in the 'process and outcome' section. These two PT features are defined below with the reasons for placing them in the same section.

Craft (2015) defines 'immersion' as 'children's deep involvement in a benign environment offering both high emotional support and a high cognitive challenge' (Craft, 2015, p.155) and 'play' as 'children's serious, highly engaged, extended exploration, developing and combining ideas, imagining situations, generating and solving diverse problems' (Craft, 2015, p.154). In addition, in the first PT model proposed by Burnard et al. (2006) (see Figure 3.5, page 81), the key features of PT were not divided into different categories and were closely connected to learners and teachers in an enabling context.

According to Craft (2015), children use immersion to strengthen their problem-solving ability. In addition, if they are highly motivated or interested in the learning, they are more engaged in lessons and react more by asking questions, expressing their ideas or displaying positive emotions (happy, excited) in the class. Based on the evidence, the children in this study were immersed in some of the learning activities because they needed to remember the important knowledge conveyed by the teacher during the class or in other activities that held their interest. This corresponds with the definition of 'immersion' by Craft (2015), which is why this evidence can be placed in the 'Play' section. The children felt playful when they were immersed in some learning activities that held their interest and this enabled them to generate more ideas or provide diverse thoughts about the learning topics, as well as enhancing their PT in the lesson.

(1) Children in School A (aged 12, primary class, Joined FI policy)

Two conclusions can be drawn regarding the children's immersion and play from the classroom observations in School A. Firstly, the children exhibited playful and 'immersion' behaviour when they were engaged in creative or imaginative activities related to their previous experience or topics they were interested in. For example, in the integrated curriculum course, the teacher asked the children to design an outline for a short written essay entitled "An adventure in the future world". The teacher began by posing some questions in order to help the children to consider the world in the future. Many children wanted to express their ideas, and because the atmosphere in the classroom was very friendly and open during these conversations, most of them were playful and happy to become involved by using their imagination in this learning activity.

Moreover, the evidence from the observations of the science experiment in the science course and from the Christmas card design activity in the computer science class also indicated that the children were happy and immersed in the activities. They appeared to be more playful when they could express their ideas in the creative card design activity, during which they were seen to be fully involved in the process of developing the design of their Christmas card. They displayed extremely high emotions and wanted their ideas to come out. I also felt that they were focusing their attention on their creative work.

In addition, the children appeared to be more interested in the scientific experiment than the other classroom activities I observed. They really wanted to know the result of the experiment and the atmosphere was also open and highly emotional (see

transcript on Page 164). This indicates that the kind of learning activity could influence children's PT in Play/Playfulness and Immersion and then it could also affect their self-determination and development (in the Outcome part).This will be discussed in later sections of this chapter, as well as the next chapter.

Secondly, the children felt playful or became immersed when they tried to find the answers to the teacher's questions, and especially so when they found the right answer. Moreover, the teacher also gave them a great deal of positive encouragement in the form of smiles or words such as "Very good" "Your idea is quite interesting (amazing)" "Excellent!" This verbal and non-verbal behaviour also appeared to enhance the children's positive emotions and had the effect of making them more playful and further immersed in their learning activities.

[A-T1-CH03-0024-0035]
> *Teacher A-1 asked the children how many meanings there were of the Chinese word-"Thief".* <
Teacher A-1: OK! There are different answers. Amy says there are two meanings; Tracy says there are three. Let's see the correct answer (the teacher uses the power point to announce the correct answer). There are TWO meanings of this word.
Children: (Very happy) YA!!!!!!!!!
Teacher A-1: You are really excellent!

(2) Children in School B (aged 11, talented class, Joined FI policy)

The evidence of children's 'immersion' and 'play' found in school B, indicated that the children were highly engaged and immersed during the classes. In addition, when the children in school B were asked to complete a task or answer questions, they usually appeared to be enjoying themselves and immersed in the activities. This may have been because the subjects or topics are very different from the primary

curriculum and they were particularly interested in learning something new. For example, based on the observation, they were very focused on reading materials related to previous research projects undertaken by former talented students. They were very quiet and followed the reading carefully.

[B-T2-LN02-0004-0250]

Teacher B: OK! Now, I will give you the explanation for the rules we didn't finish last week. When you all clearly understand the rules for the debate competition, we can start to prepare the debate topic.

Children: (Very happy) YA!!!!!!!!! YES!!!! (Looking very expectant).

[B-T2-IRA01-0006-0305]

>The children started to read the previous research projects. <

>Teacher B walked around the classroom to see if anyone had a question. <

(There was some discussion between the children. <

Teacher B: Attention. Could you tell me what we should do now?

Children: Reading.

Teacher B: So please be focused on these projects. I will give you the time to share what you have read later...

>Most of children were very focused and enjoyed reading. Some children, such as S_Lena and S_Jason also had smiles on their faces during the reading. <

[B-T2-IRA01-0008-0106]

Teacher B: What kind of research topic you read about did you find the most interesting?

(5 children raised their hands and wanted to speak)

>Teacher B allowed these 5 children to share their ideas for an interesting topic from reading the previous research projects. <

> Other children also joined the discussion and expressed their ideas if they had read the same studies. They were all really enthusiastic.<

[B-T2-IRB02-0012-0110]

>Teacher B referred to a previous study in France entitled "the relationship between probiotics and mice" as an example to explain the

procedure of data analysis. Then, he used lots of leading questions to ask the children to think about this topic. The children were very focused and appeared to be immersed in this discussion. <

Teacher B: So, how do the mice survive without probiotics in their bodies?

S_Ken: Put them into an aseptic room.

Teacher B: Correct answer.

S_Ken: YES!!!!!!!

(The other children also gave Ken a good round of applause)

Moreover, the children were conscientious in completing the task sheet in the lessons. They also enjoyed sharing their ideas or experience with other classmates during the learning activities. For example, the teacher talked about a research project related to mobile apps that aimed to understand customers' usage experience of free apps and paid apps. One child was very excited to share her experience of using these two kinds of apps. At the same time, two children also joined the discussion and expressed their viewpoints. Then, more children expressed their ideas and the atmosphere in the classroom was very friendly. Although the discussion was not quite relevant to the topic the teacher wanted to talk about, he still provided a supportive environment and the children showed a lot of enthusiasm for this topic.

[B-T2-IRB02-0013-0930]

>*Teacher B talked about a previous research project about customers' behaviour related to free and paid Apps for mobile phones.* <

S_Tony: A paid App will enable you to play more game levels than a free one.

S_Una: Or there are different functions you can use. I bought one game……

>*Child S_Una was very excited to share her experience of playing a paid App game. Other children were also interested in this issue and joined the discussion.* <

(3) Children in School C (aged 9, primary class, Not Joined FI policy)

Based on the data collected from School C, the level of the children's PT feature of 'immersion' was not the lowest in these three cases. However, another issue that needs to be addressed is the subject difference, which was found to have an obvious effect on the PT of the children in this study. In addition, it was hard to find evidence of the children's immersion or playful behaviour in some courses, such as the Chinese Language course, during the classroom observation of School C. This may have been due to the formal structure of the lesson and the fact that it included a great deal of new information to be learned. For example, one of the most important aspects of the Chinese Language course was learning new Chinese characters and, because children need to expand their knowledge of words at this stage in their learning, the teacher usually used didactic instruction to ensure that every child made progress and understood how to write the characters correctly. Therefore, the children may not have felt very excited or enthusiastic about this kind of learning activity. The learning climate in these courses was not playful, which could be explained by the fact that the children were still immersed in, or focused on, learning to develop their ability to solve problems or use it in another field in the future.

On the other hand, there was some evidence of the children being immersed and feeling playful during their learning. As noted in section of Q-P and Q-S in school C above, most children usually showed a great deal of interest in experiments (see transcripts on Page 174). There was a great deal of evidence of the children's 'Immersion' and 'Play' in the Science course due to their curiosity and the interesting scientific topics. In addition, although the teachers in school C usually used didactic instruction and did not provide the children with many opportunities to speak, they were still immersed and particularly focused on listening when the teacher used some

examples related to their daily life, which they found more interesting.

[C-T3-CL02-0105-0610]

> *Teacher E used many examples related to daily life to explain the new words in this lesson.* <

Teacher E: For example, in my family, we would call the word '叔' (pointing at the power point)our father's brother- '叔叔' (it means uncle), but not his older brother. We only call the father's younger brother 叔叔, in our culture, and we call our mother's brother 舅舅. (continuing to give more examples of family members' titles)

>*The children were very focused on the teacher's explanation and appeared to be interested in it.* <

[C-T3-CL02-0105-1130]

> *Teacher E continued to use some examples to explain the new words.* <

Teacher E: As for this word, 參, it has one meaning, which is to meet. For example, there are many ancient Chinese dramas on TV now. When the chancellors meet the king, they will say… (continuing to describe how this word is used in the ancient Chinese dramas)

>*The children were very focused on the teacher's explanation and appeared to be very interested in it.* <

In addition, the results showed a high frequency of Immersion and Play when the children were asked to draw a picture during the Art course in school C. Although the teacher did not provide them with much space to develop their ideas, she usually gave them very clear instructions, such as explaining how to draw a "BEAUTIFUL" tree or the sun. Hence, the teacher's instructions may have influenced the children to draw typical pictures. Nevertheless, it was evident that some of the children were very happy and conscientious when engaged in the drawing, which may imply that the learning topic or activity affects children's immersion and play in primary education, not only the pedagogy or climate in the classroom.

Moreover, a new point was found based on the observation of these three cases. The children could be seen to be immersed in some learning activities because they were asked to focus and learn new knowledge or skills from the class in order to develop their ability to solve problems, such as learning new characters, new words or new topics. This kind of behaviour may have been motivated by the interest of new issues in the class. However, other evidence provided another perspective, namely, that the children were highly engaged, immersed, activated and playful in some learning tasks, not only because the teacher asked them to focus on them, but also because they were initially interested in them and hoped to find more information to develop their ideas and express their creativity and imagination. This could be found in the Science classes when the children were extremely interested and very focused on the experiment. These kinds of examples could be the performance of PT in children's learning behaviour, but there could be different levels for them to use their PT because, in the first example, they learned and were successful in their learning process, but they may not have felt playful, interested or stimulated to enhance their creative or imaginative ideas in the later stages. They may have known how to deal with the same or a similar problem in the future from the way the teacher taught them in class, but they could have little or no possibility of finding another solution in a creative or imaginative way. Therefore, the evidence from my study in this section also indicated that immersion and play are very closely interrelated in the development of children's PT. Children who can play and become immersed during their learning process will have a higher level of PT than those who are only immersed in learning, but do not feel playful about it.

5.2.3. 'Process and Outcome of PT'- Being Imaginative, Innovative and Risk-taking

The intersection between the process and the outcome in the PT model in UK stage 3 children (Craft et al., 2012) is the enabling context (see Figure 3.6, Page 86). This consists of 4 PT features, namely, imagination, play, innovation and risk-taking. However, 'risk-taking' is another feature that is given more attention in my analysis because it did not exist in the previous research when the participants were 7-9 years old (in stage 2). However, the evidence in my study may match the model posed by Craft et al. (2012) because the children in the three cases were aged 9-11.

In addition, the two circles in the model (Process and Outcome) are closely connected and the features inside them could affect children's PT ability during their learning activities. For example, the features in the 'Process' part and those of 'Immersion' and 'Play' were analysed in the previous section. During the intersecting part, the features of 'being imaginative' and 'innovative' could also be linked to the previous part to influence the 'Outcome' circle, which means that they could finally affect the children's PT ability. The next sections will contain evidence that the children displayed these three PT features during the classes. Data related to the feature of 'risk-taking' will also be provided in the last part.

(1) Children in School A (aged 12, primary class, Joined FI policy)

Based on the data, it is evident that the average imaginative behaviour of the children in school A during their learning process was not low. This illustrates that they used their imagination many times during the lessons. These children may have felt more comfortable and willing to express their thoughts because the teachers in this class usually provided an open and friendly atmosphere and gave them space to express

their ideas. Moreover, the open-ended questions the teachers asked may have been important tools for enhancing the children's creativity and imagination during the lessons. Some children sometimes found it hard to express themselves, which may have been because they had limited knowledge or because they needed more time to develop their creative ideas. However, some of them were still willing to try to be imaginative or creative.

For example, in the Chinese language course, there are two different pieces of evidence of the imagination of PT from two children when they tried to answer the teacher's question.

> [A-T1-CH01-0015-0400]
> *>Teacher A-1 asked the children to imagine what grandma Wang looked like<*
> Teacher A-1: Can you imagine what Mrs. Wang looks like? I know there is a picture in the textbook, but it is just an example for you. You could still imagine Mrs. Wang's appearance. Do you have any idea about Mrs. Wang?
> S_Jimmy: I think she looks like a countrywoman, um… like a foreigner... oh oh…her personality might be very picky. She also looks like…an old idiot...

Moreover, the children in school A provided many innovative answers during the lessons, and although these creative or imaginative answers may have been incorrect or unexpected, the teachers did not reject them, nor did they interrupt the children when they were speaking unless their words were impolite or inappropriate. For example, in terms of Jimmy's description of Mrs. Wang, some parts of his answer were imaginative, but some were inappropriate. Therefore, the teacher gave a serious response and taught the children to have the correct attitude toward people's appearance during the lesson.

In addition, the teachers gave the children space to display their imagination, but they also asked them to explain the reasons for their ideas. If the ideas were impossible in real life, the teachers used questions to lead the children to review them and modify or change them to resolve the problem effectively. Moreover, since school A is one of the schools that adopt an FI policy, the teachers sometimes applied the concept of 'future imagination' to the learning activities in the hope that the children could utilise it to develop their imagination and creativity. Therefore, the teaching topic may also have provided an opportunity for the children to bring their creative ideas into the class.

[A-T1-IC03-0057-0700]
>The teacher mentioned the issue of wasting food.<
S_Jack: People waste food because they don't like it.
Teacher A-1: Why don't they like it?
S_Jack: Because it is not delicious.
S_Tom: So we improve the food to make it delicious.

[A-T1-IC03-0057-0700]
> *Teacher A-1 gave the children the work sheets. She asked them to read individually for three minutes, and then started to lead them to finish it.* <
Teacher A-1: Can you imagine what kind of house we will live in the future? What will the environment around the house be like? Is it possible that we will not see dogs anymore?
S_Jimmy: Maybe there will not be any dog poo any more.
S_Pam: I think we might step on many screws everywhere.
Teacher A-1: (Very surprised) Screws everywhere? That sounds very interesting. Can you tell us why you think there will be many screws in the future?

[A-T1-IC03-0058-1520]
Teacher A-1: How many years will it be before the world is full of technological things?
Children: 3000 years, 700 years, 200 years, 30 years…. (Different answers)

S_ Andy: Maybe people will not need to wear clothes anymore.
Teacher A-1: It sounds possible. But the weather might be much colder in the future …
S_Joyce: Humans might have heaters in their body so they won't be afraid of the cold weather. The plug would be very long but have an invisible line that you could use anywhere you liked.

The above examples also show the importance of a training programme or related knowledge of creative education for teachers so that they can provide a more open and supportive climate for children to express or develop their creative ideas during the lessons because they have received the related training and are willing to include these changes in their classes. In other words, this is about teachers' pedagogical practice, which will be discussed in later chapters.

Furthermore, the observation data from school A indicated that the children were able to produce innovative work in some activities that provided them with the space to display their full capacity. For example, the teacher in the computer science course asked the children to design Christmas cards for their friends or family. The children could use the skills of capturing pictures, videos or music from legal websites to design their cards. Although the time was limited (3 hours), after a clear explanation and some instruction of computer editing skills at the beginning of the course, the teacher provided an open and friendly atmosphere and space for the children to complete the task. In this way, the children were given space to display their creativity in designing their Christmas cards without too many comments from the teacher and they seemed very happy when making their cards. One child wrote a short poem and put it with her favourite song as a dual-style (word and sound) card.

Moreover, it was also evident that the subject and the type of learning activity may

have been important influencing factors of the children's creativity and imagination, as well as the teacher's pedagogy, which will be discussed in the next chapter.

The observation data also provided evidence of two instances in which some of the children exhibited risk-taking behaviour in School A. For example, Alex asked, "Teacher, is it possible that people will eat soil in the future?" This question may seem ridiculous from a common-sense, adult point of view, but the child was still expressing his thinking. The teacher did not answer immediately; rather, she gave the other children space to think about this idea and discuss it. However, it is undeniable that Alex had displayed risk-taking behaviour in the class. No-one could say his idea was wrong because nobody knows the future, but why did other children not express similar ideas? It seems likely that they were afraid of making a mistake, so they did not like to offer a question or answer if they were not sure of how it would be received.

> [A-T1-IC04-0059-0645]
> *> After the discussion about human behaviour in the future. <*
> S_ Alex: Teacher, is it possible that people will eat soil in the future?
> Teacher A-1: Why do you think people will eat soil in the future?
> S_Alex: Because there will be too much soil…
> S_Eileen: Because there will be no food…

Another example of risk-taking behaviour occurred in the integrated curriculum course, when Jimmy expressed an idea about why people waste food, saying that 'People waste the food because they do like it.' (see transcript on Page 187). This was also risk-taking behaviour because this was not one of the most expected answers to this problem; yet, Jimmy's idea also provided another way of thinking about the issue of wasted food. Similar to the teacher in Alex's case discussed above, this teacher also

responded in a positive and friendly manner to this kind of behaviour and gave the children space to consider the possibility proposed by Jimmy.

Apart from Alex and Jimmy, most of the children in School A did not like to express their ideas when they were uncertain of their reception. Children possibly being afraid of giving the wrong answer may also be very normal in the Taiwanese education system, especially in younger-age children. However, the willingness to take risks is very precious and children should be encouraged to do so when they have the courage to try to test any ideas they think might be right. In addition, there is only space for them to take a risk or get out of the previous scenario in order to find other possibilities by which they could finally develop their creativity and imagination.

(2) Children in School B (aged 11, talented class, Joined FI policy)

According to the data from the classroom observation, the children in the talented class were more willing to express their ideas, even when they were unsure of their answers. These were examples of "risk taking" behaviour whereby the children took a risk in frequently expressing ideas that may not have been the correct or formal answer. For example, in the 'six thinking hats' activity, one child suggested combining two differently coloured hats. Such answers may sometimes be useless, but sometimes they can be imaginative or creative and provide a different angle on the topic under discussion. The teacher in the talented class usually encouraged these kinds of answers and gave the children plenty of space to express their ideas.

[B-T2-LN04-0039-0920]
> *Teacher B talked about the different colours of the thinking hats.* <
S_Ray: Teacher, can we combine the white thinking hat and green thinking hat to make a laurel-green thinking hat?

Teacher B: No, you can't. We could combine the different thinking hats, but not in this way because it is not a real colour. It is a symbol. We can use the white thinking hat and green thinking hat at the same time, but we cannot say we are using a laurel-green thinking hat. OK? I will explain more later.

[B-T2-LN03-0037-0955]
> *Teacher B talked about the different colours of the thinking hats.* <
Teacher B: What do you think when you see the green hat?
S_Peter: Nature.
S_John: Fresh.
S_Ray: Relax.
S_Anne: Grass and trees.
S_Danny: SPRITE! (Soda drink)

[B-T2-IRB02-0012-1850]
> *Teacher B asked a question about the kind of topic that would be chosen for the research.* <
S_Ray: The problems we meet.
Teacher B: What do you mean? Can you give more explanation?
S_Ray: For example… um… teacher mentioned that Kent is usually not focused in the class (Kent did not look unhappy and he smiled when he found that Ray was talking about him. The other children also smiled)… Maybe we could look at how to help Kent to be more focused in class? Also, for another example… (He used another example as a further explanation)
Teacher B: Good. Ray's idea is a good one that we could find a topic that might be a problem or be difficult in our daily life. Then we can set it as our topic and start to find relevant information, design the study…… (the teacher continued to review the point of the research process and did not use or give a direct response for the example when Ray mentioned Danny's behaviour.

In addition, the children tended to engage in risk-taking behaviour when they wanted to express their confusion or ask a question. In the other two cases, most of the children simply sat and listened to the teacher and accepted what she telling them.

They usually refrained from making any critical judgment of the learning activities, whereas the children in the talented class of school B were more than willing to express any doubts they had in front of the whole class.

[B-T2-LN03-0038-0100]
Teacher B: Computers might be like this (taking his pen), like this pen, not big, because it is much more convenient for us to carry it everywhere. S_John: Fresh.
S_Ray: But the screen will be too small…...

Moreover, the small number of students in the class and the lack of examination pressure are also important factors that enabled the teacher to allow the children more time to discuss the topics. This did not only mean that the children in the talented class could afford to take a risk in the learning process, but the data also indicated that the teacher's pedagogical practice may have played an important role in enhancing the children's PT in this context. These factors will also be discussed in a further chapter.

(3) Children in School C (aged 9, primary class, Not Joined FI policy)

Based on the evidence from the data transcripts and the table that shows the frequency of the PT behaviour of the children in the three schools, the imagination and innovation of the children in the class of school C were particularly limited. As noted in the previous section, their PT features in the PT 'Process' or 'Process and Outcome' sections were used to a limited extent and a different frequency, depending on the subjects being learned. This indicated that the teacher's pedagogy, the type of learning activity, and even the children's age affected their display of creativity and imagination during the class. This will be discussed in depth in the next chapter. However, if the learning activities were related to formal subjects, the teachers needed

to focus on achieving the teaching goals and keeping to the schedule. Therefore, the teachers in this class used a great deal of didactic instruction, which may have been an important factor in limiting the children's creativity, as well as depriving them of chances to speak and express their ideas during the lessons.

For example, I found that the children were more creative and imaginative in the Art course than in other courses in the school C. In this course, the children were asked to draw a picture based on the topic of 'My dream campus'. They could use different kind of materials, such as coloured pencils, crayons or water colours, and combine colours to complete their art work. The teacher gave them very clear instructions and focused on helping them to complete a 'good' drawing during the class. Therefore, although the children may have learnt the correct skills or information, it may have limited their imagination. Nevertheless, one child drew houses that looked like bananas and hamburgers. He had indeed tried to develop some imaginative ideas in this picture.

[C-T4-AR01-0002-1440]
Teacher D: When you are drawing the trees in your pictures, you should think about it. What colour are trees? Are they always green?
S_Alice: No, some trees are yellow.
Teacher D: Yes! And did you find that some trees become red? Do you know what kind of trees they are?
Children: Maple trees.
Teacher D: Good! So… You should understand that trees may be many different colours, not only green.

However, there was no evidence of children's risk-taking in School C. This echoes the findings from previous research on PT that risk-taking is absent at stage 2 (children aged 7-9). The children in School C were younger than those in Schools A and B,

which may be a key factor of their willingness to follow the teacher's instructions and obey the rules. At this stage, the teachers seemed to want to teach the children the difference between good and bad behaviour. They spent a great deal of time correcting the children's behaviour, not only during the lessons, but also in the daily classroom, in the hope that the children would follow the right way and avoid failure or mistakes. This may have resulted in teaching the children to be afraid to make a mistake or take a risk when they are unsure of themselves. This kind of pedagogical stance exists in most Taiwanese primary schools, especially where younger children are concerned, because of the cultural influence, which will be discussed in more depth in Chapter VII.

5.2.4. 'Outcome of PT'- Self-Determination, Development and Intentional Action

Based on the seminal study of Burnard et al. (2006) and the questioning-focused PT of Chappell et al. (2008), the analysis of the findings illustrated 'how, through immersive play environments, children's self-determined activity led them to generate and respond to their own questions with imagination and risk-taking through innovative ideas and actions' (Craft, 2015, p.155). Therefore, this could also correspond to the PT model posed by Craft et al. (2012), which had two big circles (process and outcome) in the enabling context to prove that the PT features of 'Process' and 'Process and Outcome' increased the development of children's self-determination to display more intentional action in their learning activities.

(1) Children in School A (aged 12, primary class, Joined FI policy)

The data collected from school A provides much evidence that the children in this school showed a high frequency of self-determination. These children were highly motivated during their learning lessons at school; for example, they liked to answer

questions or express their ideas, which meant that they participated in the learning activities voluntarily. Based on the previous analysis of the PT features of Q-P and Q-S, the children may have been more motivated during the lessons by their teacher's pedagogical practice. She used many questions to stimulate them to think about possible solutions to the situations or problems she posed in the class, and this increased their self-determination to find the answer or express their ideas during the lessons.

For instance, the teacher in the Science course taught the children about the famous sculpture, "Queen's head of Yeliu", which is part of the natural landscape in Taiwan, by using many pictures and photos he had taken there. These were supplementary materials provided by the teacher, but it was observed that the children were extremely interested in these pictures and had a lengthy discussion about this topic. Some of them had also seen the sculpture and wanted to share their experience with their peers in the lessons. Another example was the Chinese Language course, when some children shared their stories about how their cats liked to stray into their neighbour's houses, and the other children sat and listened with a great deal of interest. These two examples indicate that children with a great sense of self-determination were more likely to become engaged and take action, such as asking questions or recounting their experience during these lessons. The evidence also indicated that the children were motivated to learn and develop and their intentional action was enhanced when they were immersed in the subject and felt playful and this made it possible for them to produce creative or imaginative ideas.

[A-T2-SC03-0029-0600]
> *Teacher A-2 pointed out that there is a Queen's head in the room.* <
Teacher A-2: Why is this Queen's head not near the beach? What do you think?
(Many children raised their hands and wanted to answer)

[A-T1-CH01-0015-0115]
> *Teacher A-1* talked about the experience of visiting a neighbour.<
(S_Amy raised her hand and the teacher allowed her to speak)
S_Amy: Last time I saw my cat visit our neighbour's house and …
(She started to describe a funny situation)
(Some children responded)
S_Peter: Did she (the cat) steal the fish from your neighbour?
S_John: Then? (Expressing that he wanted to know more)
S_Gigi: (Laughing) It's so interesting!!! I also had a similar experience…
(The teacher allowed another 3 children to express their ideas before continuing to another topic)

In the same lesson, the teacher asked the children to identify something abnormal in some pictures on PowerPoint. Many children were very excited about this activity and left their seats to approach the big screen in order to find the answer. Although many children still remained quietly in their seats, most of them were very enthusiastic when the teacher asked questions or raised some points. This shows that the children were more highly motivated to become engaged in learning activities when the teacher provided them with stimulating tasks.

[A-T2-SC03-0029-1258]
> *Teacher A-2 showed one power point.* <
Teacher A-2: Do you see there is one special point in this picture?
(10 children left their seats quickly and stood close to the screen to observe the picture. The other children were very quiet and sat on their chairs to look at it)

This evidence shows that some of the children were highly motivated to find the answers during the learning activities. After the teacher had asked the questions in the science class, they left their seats immediately and went to the front of the screen in order to observe the picture more clearly. This kind of intentional action also indicates differences in the learning motivation of the children.

Moreover, the children wanted to ask questions or express their doubts when they were interested in some particular topics, such as those that related to their daily lives. For example, in the integrated curriculum course, the teacher talked about the meaning of Energy Labels. The children were very focused on this topic. One child raised his hand and asked a question to express his confusion. This kind of action may indicate that the child had some personal concerns about the topic being taught.

> [A-T1-IC01-0047-1810]
> > *Teacher A-1 talked about* energy labels.<
> S_Alex: (Raised his hand, then spoke.) Teacher, is it possible that there could be a fake energy label? Because there are many news stories about fake oil or food in our society...

Therefore, the obvious behaviour related to self-determination in school A was that the children raised their hands and wanted to express their thinking or ideas energetically without any external incentives for doing so. This evidence indicated that the children were more motivated to learn about the issues they were interested in. It also may illustrate that the teacher provided a supportive environment and gave the children many opportunities to express their ideas during the lessons. The teacher's pedagogy that may have affected the children's PT will be discussed in the next chapter.

In terms of the children's intentional actions and development, as discussed above, evidence from the data showed that the children would intentionally act in order to alleviate their doubts or find answers to their questions. Finally, they developed their thinking and ideas and used them to solve problems or complete tasks. It was evident from the data of school A that the children used two main strategies that could match the PT model. The first of which was asking questions. This was a common strategy that the children used to find the correct answer immediately during the class. Some examples of this were presented in the previous paragraphs. They not only asked the teacher when they encountered small problems, but they also asked their classmates and they also preferred to ask their classmates instead of asking the teacher when engaged indifferent kinds of learning activities. For example, during the computer science class, the teacher asked the children to complete a task using their iPads. After the teacher had explained the task, the children were given plenty of time to complete it on their own. At the same time, the teacher sat at the front of the classroom and provided support for those who had questions about using a tablet. Some of the children went to ask the teacher questions, but others worked by themselves and asked their classmates when they encountered challenges.

> [A-T2-CS01-0036-0500]
> *> Teacher A-2 gave the children time to register a new account and password on the website using their iPad. <*
> *> Some of the children encountered problems and went to find help from the teacher. <*
> *>Others discussed their problems with their classmates to find a solution. <*

Similarly, the children were found to ask questions to solve their problems and this may also be seen as a process for developing their knowledge. Self-determination,

development, and intentional action are the three conceived outcomes in the PT theory, as shown in the PT model. Children may use different PT processes to help them to answer a question and then develop the relevant knowledge during the learning activities. As shown by the evidence presented in the above sections related to Question-Posed and Intentional Action, these children used the skill of asking their teachers or classmates questions when they encountered difficulties or to complete their tasks and develop the related skills and knowledge in the lessons.

Moreover, the interaction of question-posed and question-responding between children and teacher seemed to help the children to build their knowledge. There were some significant instances in the mathematics class, the topic of which was the enlargement and reduction of geometrical figures. The children were required to distinguish the kind of relationship (enlargement or reduction) between the original picture and another three different geometrical figures. One figure (figure C) was not related to the original one. Firstly, the teacher asked the children why figure C was different from figures A, B and the original one. Some of the children raised their hands to give their answer but the teacher did not indicate whether they were right or wrong. Then the teacher continued to pose questions and lead the children to think and calculate the rate of the figure's enlargement or reduction, posing a lot of questions during the discussion to help the children to develop their knowledge. As a result, the children had a clear understanding of the correct enlargement and reduction of the geometrical figures by solving the problems posed by the teacher. The skills and knowledge they learned in the class enabled them to develop their ability to deal with unknown problems or situations in the future.

[A-T1-MA01-0016-1239]

> Teacher A-1 led the children to solve the question on the textbook.<

Teacher A-1: so, you all said that Picture A is an enlargement of the original picture; and Picture B is a reduction. But why is Picture C not related to the original one?

(4 children raised their hand)

S_Jimmy: Because Picture C has an inordinate shape...

S_Lucy: Because we need to calculate the rate between the pictures and Picture C is not irregular…

Teacher A-1: You mean because Picture C does not have a relationship with the original picture? Okay… there is the last chance, Sandy.

S_Sandy: Because the area units for Picture C are….are…different… and it looks irregular…

Teacher A-1: Sandy, could you give us more explanation for your idea?

S_Sandy: Um… oh…because the length and width between Picture A are twice the original one; and between Picture C, they are half the original.

Teacher A-1: You mean that there is the same relationship between the length and width of Picture A, Picture B and the original picture, but not Picture C?

S_Sandy: Yes.

(Some children nodded their head to express their agreement)

Teacher A-1: Okay, so the short conclusion is that when the picture is an enlargement or reduction of the original one, the length and width must be…

Children: the same as the original picture.

(2) Children in School B (aged 11, talented class, Joined FI policy)

According to the data from School B, the children in the talented class usually developed their knowledge by asking and responding to questions immediately if they had an idea. The children in the talented class posed and responded to questions voluntarily and frequently. They seemed to react and think quickly when faced with a problem and they liked to express their ideas and share them with other classmates in the classroom activities. The children in the talented class seemed to be more confident in their ability and not afraid to give an answer, even if it was wrong. This was different from the other two classes in that the children in the talented class were

less afraid to make mistakes, which meant that they were more willing to take a risk in the lessons. In addition, the supportive climate and space built by the teacher also played an important role in making the children feel sufficiently comfortable to develop their creative thinking in the class.

[B-T2-IRA02-0041-1010]
> *When Teacher B asked them for a research topic they might be interested in, the children raised their hands and expressed their ideas.* <
S_Bob: Teacher, I remember I read a book related to the weather on Mars…. It said that… (Started to describe this reading experience in the lesson)
S_Tony: I watched a movie about……
(4-5 children all wanted to share their experience at the same time)

[B-T2-LN01-0002-0150]
Teacher B: Okay, now let's review the rules for the speaking order in the debate competition we discussed last time. Who can give us a hand to draw those rules on the white board?
(5 children raised their hand)
Children: Me!! Me!! Me!!!!
Teacher B: Jack, could you help me? (S_Jack is one of 5 children who raised their hand)

In addition, these children asked questions immediately when they felt confused or raised doubts about the topics in the lessons. For example, they asked, "Teacher, is this a picture with many meanings like you said, or could it be an optical illusion?" Sometimes, the children also raised a question about a hypothetical situation, such as an 'if' question. This kind of behaviour also illustrated that they had a high level of self-determination and used some intentional actions to meet their needs. It was also evident that the children used their PT ability to find answers or solve problems in the sections of 'Process' and 'Process and Outcome' in the PT model during their learning

activities in school.

[B-T2-LN03-0037-0730]

> *Teacher B showed the second picture using power point.* <

Teacher B: This is the second picture. What do you see in this picture?

(3 children raised their hand and spoke at the same time without the teacher's permission)

S_Lena: Hat!

S_Tim: Duck!

S_Roger: Teacher, does this picture have a real meaning or could it be an optical illusion? Or is it just because the position of this picture is opposite?

Teacher B: Yes, Roger's point is really interesting and it is true that we should have different viewpoints when we make a judgment or decision. Sometimes, there might not be only one answer, so remember to open your mind, open your eyes, and use your imagination and previous knowledge or experience to help you to deal with any problems.

[B-T2-LN02-0004-1815]

> *Teacher B continued to explain the rules of the debate competition.* <

(S_Tony raised his hand again and wanted to ask a question)

Teacher B: Yes, Tony?

S_Tony: If….if I found that someone was breaking the rules during the competition and I reported it after the closing argument…but… I finally found that I might have misunderstood it…

Teacher B: The jury will give the opportunity for an explanation if there is a report of anyone breaking the rules.

S_Tony: Will I be punished or will my team lose marks if I misunderstand about breaking the rules and report the wrong issue?

Teacher B: Not actually, but we should know that we need to be very careful about making a judgment during the debate.

[B-T2-LN02-0005-0840]

Teacher B: (Showed the next page of the power point) Okay, now we continue to…

(Two children raised their hand and wanted to speak)

S_Tony and S_Alex: Teacher, I have a question!!

Teacher B: Alex, you first.

S_Alex: What if the audience starts to answer the questions in the competition?

Teacher B: Well… Alex, maybe you could think a bit more about the possibility of this happening ….and now, Tony?

S_Tony: Can we interrogate or question the argument posed by another team?

Teacher B: Yes, you can.

On the other hand, the children usually asked questions to check whether their thinking or ideas were correct. For example, in the course related to individual research design, the teacher taught the children the topic of "6 Thinking Hats". After the explanation of the different meaning and function of each thinking hat, one child raised his hand and asked, "Teacher, is it ok for us to use the black hat to develop our viewpoints, then we can use the white hat to collect the evidence to prove our argument?" This showed that the children not only "asked" the questions, but also made connections or different judgments using the knowledge they had learned before and then developed their ideas or found the answer to their problems. Moreover, the children in the talented class were usually able to check their ideas or express their confusion immediately during the lessons and this kind of behaviour could have been helpful for them to develop their thinking or build their knowledge.

[B-T2-LN04-0040-0430]

S_Tim: I have a question. When we use the black thinking hat to analyse the situation, can we also use the White thinking hat to collect the information and use these pieces of information to prove our viewpoints?

Teacher B: Very good, Tim! Your idea is very good indeed. Of course you can. We cannot contradict other people's viewpoints without any evidence. Therefore, this is a good way to use the white thinking hat to find more evidence. Thanks Tim, you have given us a good idea.

>*The video showed that S_Tim had a big smile on his face and the other children also nodded their head to express their agreement with Tim's idea.* <

[B-T2-LN04-0040-0610]

> *Teacher B discussed the topic, "Teachers cannot use corporal punishment in school" with the children in this lesson. .*<

>*Teacher B allowed 3 children to express their ideas. Most of them had the same viewpoint as the students' side.* <

S_John: Teacher…. But I have a different idea…. (He started to talk about his idea which was on the teacher's side.)

Based on the analysis of school B in this section, it was found that the PT features of Q-P and Q-R could have a huge impact on the children self-determination, intentional actions and also their development. However, the supportive, open and friendly climate and environment in the class also enabled them to become easily immersed and engaged in the learning activities; therefore, the two circles, process and outcome, in the PT model were closely connected. The results of the analysis of teachers' pedagogy and the learning environment will be discussed in later chapters.

(3) Children in School C (aged 9, primary class, Not Joined FI policy)

The point that needs to be emphasised again here is that school C did not adopt the FI policy. This means that the teacher and children I observed had received no information or related training for FI or PT. Therefore, this class could provide evidence of the nature of children's PT and the kind of pedagogical practice that would affect it without the policy being implemented, as well as demonstrating the development of creative education in Taiwan.

The data showed that the children in school C demonstrated different levels of self-determination, depending on different subjects and the teacher's pedagogies.

For example, the children seemed to be more interested and more motivated to learn new knowledge in the Science course because the teaching topics were relevant to their everyday lives or previous experience. There were also some scientific experiments that they could do by themselves. The children paid more attention to these kinds of learning activities and gave more responses during the lessons. Moreover, they liked to share their ideas or experience if the topic was connected to their previous life experience, such as the experience of travelling with their family or a field trip with classmates, or exercises they had learned before.

[C-T5-SC01-0002-1500]

> *Teacher E mentioned that the children visited the National Taiwan Science Education Centre during the science course last week.* <

Teacher E: Could you tell me what you found out related to "AIR" when you visited the National Taiwan Science Education Centre last week?

> *(Many children raised their hand and wanted to speak)* <

[C-T2-CL01-0076-1130]

> *Teacher C sometimes gave the children the opportunity to speak during the lesson.* <

Teacher C: Now, we understand the author's main ideas in the article, so let me ask you a question. What kind of place do you think of when you think about the Science Education Centre and the Planetarium?

(Two children raised their hand and wanted express their ideas)

(The other sat quietly, listening)

Teacher C: Yes, Nancy?

S_Nancy: First, I think there are many stars…..

Teacher C: okay, so you say there would be many stars in the Planetarium. How about the Science Education Centre? What will be inside that?

(8 more children wanted to speak, but the teacher only asked one of them to do so)

[C-T2-SCE01-0081-1150]

> Teacher C posed an example that was related to daily life. <

Teacher C: I think you all know there is a famous exercise called 'snake board' that some of you have learned before. This exercise is very interesting, but it also has many high level skills, so you should have a professional trainer beside you to prevent any possible accidents…

(The children seemed very happy to listen to the teacher's explanation about this topic. Some of them seemed to want to share their ideas about this exercise, but the teacher did not give them a chance to speak)

(After explaining the importance of staying safe when doing any kind of exercise, the teacher went back to the textbook and continued teaching another topic)

On the other hand, in the Art course, the children were requested to draw a picture that had a specific topic and it would be marked. In addition, the teacher did not give the children much of chance to share their ideas and the climate in the classroom was quite serious because she hoped that the children would follow her instructions and complete a 'good' product. Therefore, although there are no exams of test pressure in the Art course, the teacher's pedagogical practice could still affect the children's to use their PT during their learning, which will be discussed further in the next chapter.

Besides, the teacher of the Science course in School C used a scoreboard to increase the children's motivation. A scoreboard is a performance-based award system and it worked well when the children were asked to tidy up their experimental tools, and they moved faster in order to be awarded a high score. Moreover, T1 used a similar reward system in her lessons to encourage the children to study or discourage them from making mistakes.

[C-T5-SC01-0002-0600]

Teacher E: If your performance is good in today's lesson, I will let you do an extra experiment about "Smoking", but the smoking does not

involve real smoke.

Children: Ya!!!!!!

[C-T3-CL01-0002-1700]

Teacher E: Attention! Now we will start to clean the tables. I will add points to the first group to finish cleaning their table. Okay…now, start!

> *The children in the groups started to clean their table and they were very focused and tried to be the first to finish in order to obtain the points.*<

In terms of the children's development and intentional action, the evidence showed that the level of these two elements was not very high in school C. The children usually followed the teacher's instructions so that they were very quiet when completing the task or work the teacher had set them. The impact of this kind of teaching method is to help children to develop their ideas in the correct way (as the teacher told them). Receiving feedback, comments or support from the teacher or other students enabled them to develop their production. For example, they learned artistic skills, such as how to use the correct colours and materials to develop their ideas by asking questions or listening to the teacher's comments in the class. Therefore, they also acquired the skill to develop their art in this course. In addition, it may have been because the children in school C were younger than those in the other two schools and the teachers used the traditional didactic instruction to ensure that the children could learn the knowledge in a short time to prevent them from failing to learn. This issue will also be discussed in the next chapter.

In summary, the children sometimes also asked the teacher or their classmates questions in order to solve their problems, evidence of which was presented in the previous part (Question-Posing and Question-Responding, Page 161). Chappell et al. (2008) also found that the way children became engaged in this Q-P and Q-R to

generate innovation played an important role in the inherent breadth of possibilities in classroom activities (Craft, 2015). Therefore, the analysis of the 'Outcome' in the PT model indicated that the PT features in the Process circle could provide support and enhance the features in the Outcome circle. It was also found that teachers' pedagogy affected children's PT in this enabling context, and since this is worthy of further discussion, it will be analysed in the next chapter.

5.2.5 Peer Collaboration

Strong evidence of the features of PT in older primary children aged 9-11 (Craft et al., 2012), apart from 'risk-taking', was found in previous studies of PT. However, Craft et al. (2012) revealed a new PT feature in their study, namely, 'Peer Collaboration', which is thus identified as an emergent PT feature. This is documented as being integrated with children's engagement in imaginative and playful behaviour (Craft, 2015, p.156), usually in older children; therefore, this feature can influence both the 'Process' and 'Outcome' of children's PT development. More interaction and dialogue between children during learning activities has been found to enhance their ability to question, be creative or imaginative, or to develop their thinking skills. This feature could exist in primary schools, since the children in the three cases in this study were aged between 9 and 12. However, one issue that needs to be addressed is that most of the learning tasks in classes in Taiwanese primary schools usually have to be completed by the children themselves. Some teachers prefer the children to do the work individually and tend to provide support only when they are needed in order to keep order and maintain the rules in the classroom. Only a few courses may include group activities for the children to do or solve problems together. Therefore, this feature was also a focus of the analysis to find evidence of 'how peer collaboration affects the learning behaviour of individual children or groups', and whether 'it

happens in Taiwanese primary classrooms and affects the children's PT'. The evidence from the classroom observation in the three schools is provided in the next section.

(1) Children in School A (aged 12, primary class, Joined FI policy)

The data of school A demonstrated the children's collaborative behaviour when the teacher gave them tasks during the lessons. Collaborative behaviour was observed in two types of classroom situations, namely, group activities and individual activities.

Firstly, some lessons included group activities in which children in the same group collaborated with each other to complete the task or find the answer to the teacher's questions. For example, there were six children in one group in the science class and the teacher asked them to complete the scientific experiment he had explained at the beginning of the class. He then gave the children sufficient time to complete the experiment and finish answering the questions in the textbook. The children in the same group collaborated and engaged in discussions in order to complete the experiment. Although there was some disagreement during these discussions, it was also a good way for the children to compare different thoughts or ideas to find the correct answer.

In addition to the expected collaboration when the children were assigned a group task, the observation data also showed that they sometimes collaborated during tasks that had been designed for them to do individually. They asked questions or shared their ideas with another child sitting near them. For example, in many courses, such as computer science and Chinese language, the teachers asked the children to complete the design of their individual Christmas cards and their short written work. After

explaining and introducing the tasks, the teacher provided sufficient time for the children to complete their work, which they usually did sitting in their seats individually. However, it was observed that some children asked their classmates for their opinions or assistance. 'Do you think I could use this picture for my Christmas card?' 'Which music do you think is better for my design?' 'I don't remember what the function of this button is (iPad's App). Do you remember how to use it?' The children whose help was requested were usually very kind and willing to discuss their ideas. There were many short conversations illustrating the children's collaboration during the learning activities.

Furthermore, the teachers in school A also designed some collaborative activities during the lessons. Firstly, a teacher asked the children to answer the mathematical quiz individually. Then, she did not announce the answers to the questions. She asked the children to exchange their task sheets with the other children sitting next to them. Therefore, the children worked in pairs to discuss their answers to the mathematical quiz. If their answers differed, the children collaborated to determine the reasons and tried to find the correct answer. During this collaborative discussion, the children were able to understand the different ways or learn the correct ways to solve their problems.

(2) Children in School B (aged 11, talented class, Joined FI policy)

The teachers in School B designed different kinds of activities for the children based on the curriculum and various topics. Some course teachers organised group discussions to accomplish the tasks. For example, the children were divided into two groups to prepare for the debate competition, and they each had to develop their argument and find evidence or resources to support it; therefore, children in the same

group needed to discuss and reach a consensus during this preparation process. The data showed that they had the different viewpoints when they needed to choose a topic. Many serious agreements were made during the lessons because the teacher helped to coordinate the different ideas in the team, so that the children finally made a decision about the topic and they all tried their best to prepare for the competition.

Although disputes sometimes arose when group members had different points of view, peer collaboration had many benefits for the children. Learning to compromise and respect an other's opinion was another lesson for the children to learn during these courses. Peer collaboration also enhanced the children's PT when they encountered problems. They could hear more points of view and employ different angles of thinking or different approaches to solve their problems.

Moreover, the children of the talented class in school B also showed that they were willing to give their opinions to others when someone asked for their comments. The features of PT in the children of the talented class should be different from those of the children in the primary class because of their different learning behaviour. This will be discussed in chapter VII.

(3) Children in School C (aged 9, primary class, Not Joined FI policy)

Based on the data, the children of school C sometimes asked their classmates questions during the group activities. For example, there were two children in one group in the Integrated Curriculum course and their task was to complete a poster about the Queen's Head Rock (a famous sculpture in Taiwan's Yeliu) and each group had to make a short presentation at the end of the course. After the teacher illustrated the point, aim and production process using multiple resources (PPT, video,

and sample products from previous students), the children were given time to complete their poster. Because this was group work, the children discussed the details and solved the problems they encountered by cooperating. For example, one child asked his partner, ‘Do you think it is ok to put this picture here? ’ ‘What do you think?’ They needed to cooperate to complete their poster and sometimes they also argued if they had different opinions. When this happened, they raised their hands to ask the teacher’s opinion.

Thus, the Q-P and Q-R of the children in the group activities also showed that they tried to solve their problems by interacting with another child or classmate during the learning process.

There are more individual tasks than group work in most Taiwanese primary schools so that the teacher can control the order more easily. However, peer cooperation was not only shown in this group task, but also appeared in the individual work when the children tried to find support from their classmates to help them to deal with the difficulties they encountered in the learning activities. In summary, it was shown in this study that the PT feature of ‘Peer Collaboration’ existed in these three cases, not only in the group task the teacher asked them to complete, but also in the context of child between child. The more interaction there was between teachers and children and between child and child, the more opportunities there were to practice questioning and self-determination, and the more likely they were to produce creative or imaginative ideas.

5.3 Conclusion of the children's PT in this empirical study

The analysis of the evidence from the classroom observation has shown that the 11 features of PT were present in each of the three primary schools researched in Taiwan. This can be considered to support the PT model posed by Craft et al. in 2012. Also, the evidence of Q-P and Q-R suggests that questioning not only affected the children's PT, but also their learning process, because it could affect their other PT features or PT ability. Children are more likely to express their ideas and develop their thinking and self-determination if they have a more open, positive and friendly space. Based on the evidence of this study, breaking the traditional learning climate, in which children are usually told to sit and listen, will give them more opportunities and space to ask questions. This will depend on teachers' pedagogical practices, as will be discussed in later chapters.

However, based on the above evidence, the frequency of the 11 features in children's PT behaviour is quite different in the three cases studied. Children's PT can be influenced by their age (their background knowledge), class type (primary or talented class), teachers' different pedagogical practice (under the FI policy) and also different subjects. Therefore, the impact of teachers' pedagogy on the development of children's PT in Taiwanese primary schools will be addressed in the next chapter and other elements that can also influence its development will be explored in later chapters.

Chapter VI

Pedagogical Practice in the three schools

6.1 Introduction

Having analysed the empirical data to identify the presence of children's PT in three different primary schools in Taiwan, the focus of this second analytic chapter is the pedagogy of the teachers. This chapter contains an analysis of the pedagogical practice of the teachers in the three schools, particularly in terms of how the kind of pedagogical approach adopted, influenced the degree of children's PT in observed lessons. This should provide further insights into the teacher's role in the application of creative education in primary classrooms in Taiwan. Moreover, teachers' pedagogy was included in the conceptual framework to determine the relationship between learners' PT, teachers' pedagogy and the learning environment because a connection was found between these three concepts in the review of previous literature, as explained below.

Since Taiwan is heavily influenced by Chinese culture, its social context and educational field are very different from those of western countries. Based on a review of existing literature related to the social context in the Chinese world, the educational system in Taiwan is normally strongly teacher-centred. Although the Taiwanese government has attempted to promote creative education in recent years with the introduction of the Future Imagination policy (FI), schools have been slow to adopt it. Since the analysis of children's PT in the last chapter confirmed that teachers' teaching methods do increase or reduce children's PT ability, much more attention needs to be paid to how Taiwanese teachers' pedagogy can change children's learning,

not only in terms of creativity or imagination, but also in the building of knowledge or critical thinking skills.

Two of the three primary schools observed had adopted the FI policy and one had not. This provided an opportunity to ascertain if the implementation of this policy had made a difference in enhancing the creativity and imagination of Taiwanese children in primary schools.

Since learners were the focal point of the last chapter, this chapter will contain an analysis of the teachers' creative pedagogy and the classroom environment, which were included in the conceptual framework in Chapter III (See Figure 3.11, Page 108). Some of the teachers' pedagogical practice used in Taiwanese primary education, but not included in the conceptual framework, will also be analysed based on the evidence gathered from the classroom observations. This pedagogy deserves to be part of the discussion because it clearly exists in Taiwanese primary schools and it may affect children's learning or creative development.

In summary, this chapter will firstly contain a short description of the teachers in these three case study schools before proceeding with an analysis of their pedagogy, which will be divided into three sections; teachers' creative pedagogy, learning environment, and other pedagogical practices used in Taiwan. The analysis will not only include a description of the pedagogical aspects, but also evidence of the relationship between the teacher's pedagogy and the children's PT.

6.2 Teachers in the three cases

Six teachers were observed in three classes of three primary schools in Taiwan. Based on an in-depth understanding of their pedagogy, the number of years these teachers have been teaching and the subjects they teach in the three primary schools are shown in Table 6.1. All the teachers used their own pedagogy, but they usually chose different teaching methods for different subjects. Some of them observed the children's reaction very carefully during the class so that they could immediately provide support where it was necessary to help the children to learn. This support was not only in the form of 'real' help, such as telling the students the correct answer or teaching them to use specific methods to solve problems. Some of the teachers in this study used a great many leading and open questions as scaffolding based on the children's level of knowledge to help them to understand when they felt confused in the lessons.

Table 6.1The background of teacher in three cases

	Teachers	Number of years teaching	Subjects taught
Case I- School A (Primary class) (Joined FI)	Teacher A-1	8 years	Chinese Language, Mathematics Integrated Curriculum
	Teacher A-2	6 years	Science, Computer Science
Case II- School B (Talented class) (Joined FI)	Teacher B	10 years	Debate, Individual Research

Case III- School C (Primary class)	Teacher C	12 years	Chinese Language, Social Science, Integrated Curriculum
	Teacher D	30 years	Art
	Teacher E	15 years	Science

However, some of the teachers tended to use traditional pedagogical practices, such as didactic instruction, or they told the children the answers instead of encouraging them to think for themselves. This is a frequent practice in some Taiwanese primary schools. For example, the data showed that some teachers in school C habitually told the children "what they should do" or "how they could do" something during the lessons because they thought that this was the best and fastest way for children in the third grade to learn. This kind of pedagogy represents a typical traditional teaching environment in Taiwanese primary schools because teachers have not adopted creative pedagogy suggested by the FI policy, or in some cases are reluctant to change their usual teaching methods, thereby failing to promote creative education. The data collected from school C again illustrated the significant role of the teacher in the learning process of children in primary education. The teachers' pedagogical practice during the lesson and the learning environment they created in the class will be examined in the following sections in order to determine the effect on the children's PT or the learning process in these Taiwanese primary schools. Moreover, any pedagogy used and observed in the study that could possibly have affected the children's learning will also be examined to ascertain its connection with creative education in Taiwan.

Figure 6.1 shows the three main parts of teachers' pedagogy observed in this study. The first part includes three pedagogical practices, which are 'providing children with opportunities to speak', 'teacher's encouragement' and 'different approaches to instructions'. Some of these could enhance children's creativity. In the second part, the learning environment and climate provide the context for learning. The last part is described evidence of teacher's pedagogical practices used which might not be directly linked to learning but part of establishing behaviours to support learning.

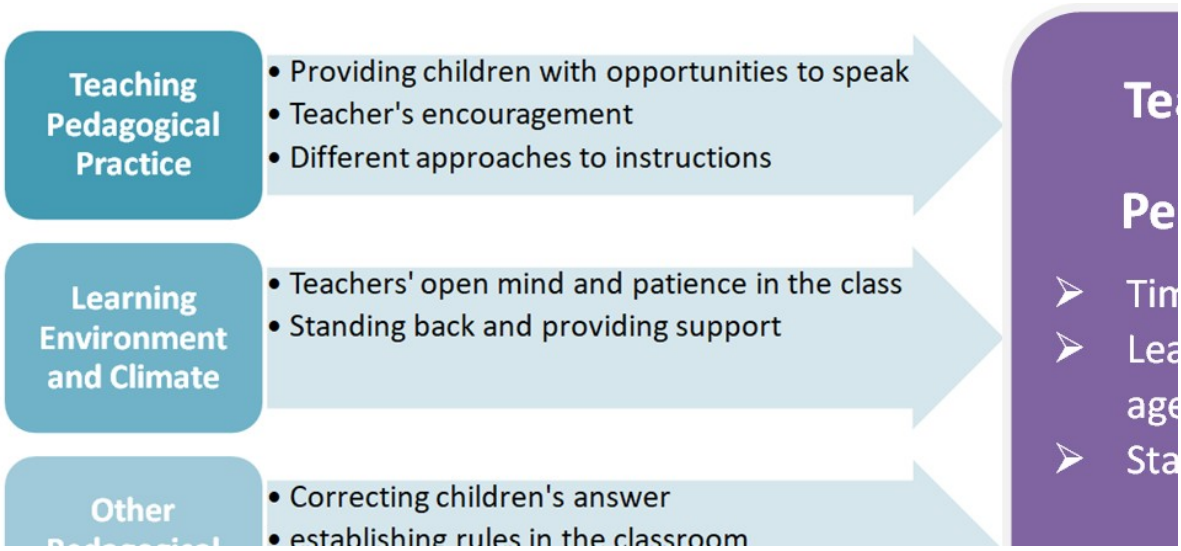

Figure 6.1 The categories of evidence of teacher's pedagogy in this study
Source: Organized by author

6.3 Teacher's pedagogy and learning environment in the three primary schools

According to the conceptual framework in Chapter III, creative pedagogy has three main components, namely, learners, teachers and the environment. In terms of learners, the children's PT was analysed in order to understand creative learning in primary education. It was then necessary to explore the influence of teachers and the learning environment in an enabling context in Taiwanese primary education. Therefore, evidence of the teachers' creative pedagogical practice in the three cases is

presented below.

6.3.1. Providing children with opportunities to speak

Teachers usually possess most of the power in Taiwanese primary education classrooms and they can choose how to provide children with opportunities to express themselves or have a discussion based on maintaining order in the class. According to the data from the three different schools, the children were provided with various opportunities to speak, but their creativity seemed to increase when they were given more space to express themselves. This could have been due to building a supportive environment, which will be discussed later. However, evidence from previous studies as well as this one shows that the provision of a creative learning environment gives children a greater opportunity for creative learning activity (Craft, 2005; Jeffrey, 2006).

School A: Teacher A-1

In school A, teacher A-1 usually provided children with opportunities to speak during her courses. She sometimes asked questions and led the children to answer or express their ideas spontaneously.

[A-T1-CH01-0015-0826]
> There was one topic- "retirement" in the lesson. Teacher A-1 and students talked about this issue. <
Teacher A-1: What do you think when you see the word 'retirement'? What's your understanding about this word?
(4 children raised their hands and wanted to speak)
S_Ann: The hair was very white.
S_Jane: He/she could have the retirement pension.
S_Peter: The age might be very old.
S_Nancy: One year older.

Teacher A-1: One year older? Nancy, I cannot understand what you mean. Could you give us more explanations?

In this case, it was clear that the children liked to answer the teacher's questions if they were given an opportunity to speak. Teacher A-1 did not explain the meaning of the word 'retirement' directly. She used a question and hoped that the children could express their idea of the meaning. Even though some of the answers may have been incorrect, teacher A-1 was still patient and asked more related questions to check the children's ideas.

[A-T1-IC01-0047-0812]

> Last week children read a book called 'Seekers' (Author: Erin Hunter). This lesson teacher A-1 used the book as a basis for a discussion about the earth's resources. <

Teacher A-1: Last week we read the book Seekers, many of you told me it was really interesting. Could you think of any issue related to the earth's resources in this book?

S_Johnny: Humans' over-development.

Teacher A-1: Very good! And there is another issue about the unequal distribution of resources. But there is one important question we need to notice. Is it related to justice? We could think about it. Moreover, we could also connect with the homework today, your short written diary - 'Where does the bear go?' In today's earth environment, where do you think the bear would go?

Teacher A-1 liked to prepare many different supplementary materials, which she used to pose questions in the class connected with the concepts she wanted to teach. When using these questions, she also provided many opportunities for children to practice their thinking ability or speaking skills.

Furthermore, Teacher A-1 sometimes assigned a particular child to answer a question or express an idea because some children were very shy or quiet in the class.

Therefore, teacher A-1 provided a chance for them to practice their speaking and thinking in the hope that they could express their ideas spontaneously in the future.

[A-T1-MA02-0031-0020]

> *Teacher A-1 gave the children five minutes to answer the questions in the textbook individually. She also provided some examples for the children to help them complete the answers.* <

Teacher A-1: OK, now everyone should finish it. Cindy, could you tell us how you answered question No.1? Please tell us the detail of your calculating process.

[A-T1-MA02-0031-0718]

Teacher A-1: Very good. Mark, could you answer question No.5?

Some of the children were very active in the lesson and were often keen to express their ideas; however, teacher A-1 usually chose different children to answer questions in order to ensure that every child had an equal opportunity to speak. This also enabled the teacher to ensure that the child understood the target concept correctly. However, sometimes the teacher chose a child who was obviously not concentrating on the class to answer the question.

[A-T1-MA02-0031-0600]

> *Teacher pointed out the questions from Cindy's answer.* <

Teacher A-1: Why do we use 2 to present the length of picture A, why not use 4?

>*There were two children (Tracy and Jane) who wanted to answer this question.* <

Teacher A-1: (Did not choose Tracy or Jane) (Looking at Jimmy and Johnny who are not very focused on the discussion) Jimmy, could you tell us why?

>*Jimmy did not answer.* <

Teacher A-1: Johnny, how about you? Could you tell us what you think?

In addition, teacher A-1 gave a child with learning disabilities a chance to practice because he was usually very quiet and reluctant to join the activities in the class;

therefore, the teacher hoped that this would give him a chance to participate in the lesson.

[A-T1-CH02-0022-1400]
> *Teacher A-1 finished the explanations of the words in this lesson.* <
Teacher A-1: (Looking at Alex, who has a learning disability) Alex, could you speak these words for us?

Based on the evidence from the data of School A, it is clear that teacher A-1 is extremely patient and likes to develop a friendly, open and positive space for teaching and learning. She also focused on being fair and providing every child in her lessons with equal chances. The positive and supportive learning environment provided by teacher A-1 gives the children in her lessons plenty of space to express their thoughts and ideas.

School B: Teacher B

The average number of children in one course of the talented class was 8-10. This class was relatively small compared to the primary classes in Taiwanese primary schools. Therefore, children in the talented class had more opportunities to speak.

Based on the classroom observation in school B, it was clear that teacher B used a great many questions in the courses, which he asked the children to answer, discuss or think about. Therefore, the children in the talented class had more chances to express their ideas.

[B-T2-LN01-0002-0140]
Teacher B: At the beginning of the class, let's review the content of our last lesson. We talked about the order in the debate competition. Who could draw

the correct order on the white board for us?

>5 children raised their hands. Teacher B chose S_Jim to answer.<

>S_Jim went to stand in front of the white board. He wrote down his answer and also explained it to his classmates. <

>Teacher B helped to conclude his answer and also let other children who wanted to add more information about this topic. <

[B-T2-LN04-0040-0610]

> Teacher B introduced and explained the black thinking hat in the class. <

Teacher B: So… Now we are talking about the issue of "Teachers cannot do corporal punishment in school". Please wear the black thinking hat, then tell me the disadvantages are for this issue?

>Many children raised their hands and wanted to speak and teacher B let them speak one by one. <

>While the children were speaking, teacher B made notes on the white board for organising students' ideas. <

>When the children finished speaking, teacher B started to analyse their ideas and gave a short conclusion for this issue. <

[B-T2-IRA01-0008-0106]

>Teacher B gave children 20 minutes to read the research projects which had been done by previous students in the talented class of school B.<

Teacher B: Ok! After reading these projects, could anyone share with us what research you are interested in?

>5 children raised their hands. Teacher B let them to speak one by one. <

S_Joe: I read one project is about electricity. (He started to describe the abstract of this research)

S_John: I saw one article is about comic books.

Teacher B: Okay, so that research is about comics. Was the researcher drawing comics?

S_John: No, he said when he was 3rd grade in the primary school. He found that… (S_John started to describe why the researcher chose comics as his topic and how he did the research.)

Teacher B: Very good! Thanks John for sharing. So… could you tell me where you could find the motivation for research to do the research in the article?

>3 children raised their hands. Teacher B gave all of them an opportunity to answer this question. <

Moreover, teacher B gave the children in his lessons an equal opportunity to express their thinking by sometimes asking them all to answer the questions one by one. If a child appeared to have little to say, he would ask some related questions to encourage him/her to express more ideas about the topic.

[B-T2-IRA02-0042-0600]

>*Teacher B asked every student to answer the five research questions which were shown on the Power Point.* <

S_Tim: I think the answer to question no.3 is the experiment design.

Teacher B: Why did you choose the experiment in your research method?

>*S_Tim tried to talk about his reasons and also gave an example to support his viewpoints.* <

>*After the children had spoken, teacher B organised their ideas and used more examples to add information. Then, he would provide a conclusion for the discussions.* <

[B-T2-IRB01-0011-0435]

>*After 2 children had spoken, teacher B concluded these two ideas.* <

Teacher B: OK! So, we could find the ideas from S_Michael and S_Joe are the same viewpoints. Does anyone have different ideas about this topic? Or you think other research methods might be more suitable for the topic?

>*S_Johny raised his hand. Teacher B asked him to answer. Then, teacher B let 3 more children express their ideas. (Every child did some speaking in this lesson).* <

School C: Teacher C, Teacher D and Teacher E

The classroom observation in School C showed that Teacher E provided more opportunities than Teachers C and D for children to speak. In the science course, Teacher E usually asked a great many questions for children to answer and express their ideas. Moreover, he never directly told the children the correct answer, but instead, asked them more questions after they had spoken and then gave them more

chances to acquire a deeper understanding of the course topics.

[C-T5-SC01-0002-1500]

> Teacher E mentioned that the children visited the National Taiwan Science Education Center in the science course last week.<

Teacher E: Could you tell me what things you found out related to "AIR" when you visited the National Taiwan Science Education Center last week?

>Many children raised their hands and wanted to speak. <

S_Tom: I found something is related to magnets.

Teacher E: No no no….my question is…what did you find out related to the AIR?

S_Fiana: Yes!!! I remember there is the toy… um… it could let water float on the air.

Teacher E: Could someone give us more descriptions of this toy?

S_Tim: It is the toy…..(Started to explain the structure of the toy.)

> Then Teacher E let another two children to express their findings. <

[C-T5-SC01-0002-0730]

> Teacher E took out many syringes then pointed to one syringe. <

Teacher E: What is inside this syringe do you think?

Children: Air!!!

Teacher E: Are you sure it is AIR inside this syringe?

Some children: Water…..

Teacher E: (took another syringe which is filled with blue liquid) How about this one?

S_Alice: Water and water colour pigment.

S_Luis: Seawater.

Teacher E: Alice's answer is correct. There is water and blue water colour pigment in it. (took another syringe which seemed empty) How about this one?

S_Tim: Um….I don't know….

S_Ben: Air.

Teacher E: The answer of "I don't know" is better because we are not sure what's inside until we do the experiment for confirmation.

[C-T5-SC01-0002-0950]

> Teacher E wrote two questions for today's experiment.<

Teacher E: The first question is "Can the air be squeezed when it is in the syringe?"

> Some children answered "Yes" but some children answered "No". <

Teacher E: Does anyone have a different answer?

However, Teacher C in the Chinese language course, and Teacher D in the art course did not provide many opportunities for the children to speak. They used more didactic instruction methods, which usually involved providing the correct answer directly rather than helping the children to find the answer themselves. The reasons these teachers did not provide the children with opportunities to speak will be discussed in a later chapter.

[C-T4-AR01-0002-0400]

> *Teacher D took one child's drawing as an example and asked students what the main character in this picture is.* <

Teacher D: Let's see…. The main character in this picture is… um…. hamburger and fries?

Teacher D: What's the problem, do you think, in this drawing?

S_Mandy: Too empty.

Teacher D: Well… You cannot say it is too empty. In my opinion, he did not finish it and he tried to use this road to connect… (Started to explain the picture.)

> *After Teacher D's explanation, the child who drew this picture raised his hand to express his idea about why he designed this picture because he did not agree with the teacher's explanation of his work.*<

Teacher D: Oh… So you (the child who drew this picture) should provide a much clearer expression in your picture.

[C-T4-AR01-0002-0618]

> *Teacher D took another child's drawing as an example*. <

Teacher D: Okay, now let's see this one…. What's the problem, do you think, in this drawing?

> *Children were still thinking and did not give their responses immediately.* <

Teacher D: (Pointed to two clouds in the picture) Did you see there are two clouds in this picture? Which one do you think has the problem?

Children: The one on the right side.

Teacher D: What is the problem with that cloud?

Some children: The colour is a little strange.

Teacher D: Good! You got it! The left side one is good but the right one is not good. The artist seems to have been impatient with this right cloud. So, in this situation, we should…. (Started to explain how to modify it.)

[C-T3-CL01-0002-1130]

Teacher C: Okay, now we understand what the author's ideas are. Could you tell me what kind of place you think of when we mention the Science Education Center and Planetarium?

> *Two children raised their hands and wanted to speak.* <

Teacher C: Andy

S_Andy: A lot of stars.

Teacher C: A lot of stars… good. So how about the Science Education Center? What might be included in it?

> *Eight children raised their hands and wanted to speak. But Teacher C only let one child express his idea then she finished this topic and returned to the textbook.* <

[C-T3-CL01-0002-0350]

Teacher C: Now, who can use the same structure of this sentence to make a new sentence?

> *Many children raised their hands and wanted to speak. Teacher C only let one child express her idea then started the next sentence.* <

[C-T3-CL03-0002-0945]

Teacher C: Could you tell me whether there are any characters that also have the radical of "八"?

S_Wendy: The character – "共".

Teacher C: Good! Could anyone indicate more characters?

In short, the evidence in these three cases showed that some of the teachers did provide the children with a great many opportunities to express their ideas in class. Although the children in school C were given these opportunities less frequently than those in the other schools, there was still some evidence to indicate that some teachers used this pedagogy if they had enough time or the subjects were flexible. This will be further discussed in the next chapter.

6.3.2 Teachers' encouragement

Both verbal and non-verbal feedback from the teacher plays an important role in education. Many researchers also maintain that children not only need a positive atmosphere; they also need a supportive environment and encouragement and rewards from adults or peers during their learning activities (Toivanen, Halkilahti and Ruismäki, 2013; Cremin, 2015). Children are likely to feel more confident when they receive positive feedback from teachers, since it can reduce their anxiety if they feel they did not perform well in class and it may also give them more courage to try new things or express their ideas. Therefore, teachers' responses to the children during the lessons in these Taiwanese primary schools were a focus for observations.

School A: Teacher A-1

The evidence in the data indicated that teacher A-1 usually gave the children positive feedback when they performed well or to encourage them to participate in the learning activities in the lessons. Moreover, the data also showed that the children had more enthusiasm when they received the teacher's encouragement in the class.

[A-T1-CH03-0024-0035]

> *Teacher A-1 asked the children how many meanings there were of the Chinese word-"Thief".* <

Teacher A-1: OK! There are different answers. Amy said there are two meanings. Tracy said there are three. Let's see what's the correct answer? (Teacher uses the power point to announce the correct answer) TWO meanings of this word.

Children: (Very happy) YA!!!!!!!!!

Teacher A-1: You are really excellent!

[A-T1-MA02-0031-0855]

> *Teacher A-1 led the children to answer the questions in the textbook.* <

Teacher A-1: Well, thanks Nancy's answer, it is the correct answer. All of you are

very good! Now, please take out your colour pencils and write the note at the length and width of picture 2.

Moreover, teacher A-1 gave encouragement to children when they did the work in the lessons individually and these positive words from the teacher seemed to motivate the children during their learning activities. Besides, teacher A-1 usually walked around the classroom to monitor children's progress and provide them with support as soon as they needed it.

[A-T1-IC04-0059-0008]

> *Children continued to complete their written work individually.* <

Teacher A-1: (Sounding very positive and clear) Fighting!!! Please do not be afraid if your writing progress is slower than others. It doesn't mean you are not good. The most important is, you need to make a clear outline of each paragraph of your written work, and then you could complete it more quickly.

School B: Teacher B

Although the children in the talented class of school B may have been more willing than children in the other classes to express their ideas during the lessons, teacher B still encouraged them to think and speak out. For example, if some children could not provide the answer immediately, teacher B not only gave them more time and tried to encourage them, but also gave hints for some children who did not catch the point. He also tried to appease children's emotions and used positive words to boost their confidence.

[B-T2-LN03-0037-0450]

> *Teacher B showed the issue by using Power Point. The Topic is "To revise your habits in thinking the problems".* <

>*There is a picture on the Power Point slide.* <

Teacher B: Could you tell us what you can find out in this picture?

>4 children raised their hands and wanted to answer but teacher B did not let them speak immediately. <

Teacher B: Well….. Could everyone find it?

>Still 4 children raised their hand to indicate that they had found something in the picture. <

Teacher B: Okay… now we have 4 who have found it. Let look at it more slowly and carefully. Could everyone find it? …. OK! Good! Don't worry! Who cannot find the figure in this picture?

>3children raised their hand. <

Teacher B: Okay… You all did a good job. Please do not feel frustrated if you cannot find the figure. Because we usually use similar thinking methods to solve the problems, let's try another way. Please look at the WHITE part in this picture….. Could you find anything in that?

S_Lucy: Oh…..I find it!!!! (Very excited)

S_Johnny: Yes!!!!!

Teacher B: I found someone still cannot find it. Don't worry! Keep your attention on the WHITE part in this picture….. Don't consider the black part.

S_Tim: (Tried to give the support for his classmate who could not find it) You could squint your eyes then you could find it.

Moreover, teacher B made positive comments while the children were speaking, such as "yes…", "I see…."or "good!" These positive comments, combined with his use of eye contact, suggested that he was very focused on listening to what the children had to say.

[B-T2-IRB01-0011-0240]

>Children started to express their ideas about the topic. Teacher B would give them positive words, such as "Yes", while they were speaking. His eyes were also focused on the children and he appeared patient in listening to their words. <

[B-T2-IRB02-0012-0605]

>When children expressed their ideas during the discussion, teacher B would use some positive comments, such as "Very good!", "Excellent" or "Good job!", as encouragement. <

>After the children had spoken, teacher B gave them more related examples and

gave a conclusion. <

Besides providing encouragement while the children were speaking, teacher B usually gave them positive feedback and encouragement when they behaved well or proposed good ideas. This kind of feedback may have a positive function of helping children to feel more confident and willing to express their ideas in the classroom.

[B-T2-LN04-0040-0430]

S_Tim: I have a question. When we use the Black thinking hat to analyse the situation, could we also use the White thinking hat to collect the information and use these pieces of information to prove our viewpoints?

Teacher B: Good job, Tim! Your idea is very good. Of course you can. We cannot controvert other people's viewpoints without any evidence. Therefore, this is a good way to use the white thinking hat to find more evidence. Thanks Tim, you gave us a good idea.

>*The video showed that S_Tim had a big smile on his face and other children also nodded their heads to express their agreement for Tim's viewpoint. <*

[B-T2-LN04-0040-0610]

> *Teacher B discussed the topic of "Teachers cannot do corporal punishment in school" with children in this lesson. .<*

>*Teacher B let children express their ideas. Most of the children had the same viewpoints which were on the students' side. <*

S_John: Teacher…. But I have a different idea…. (He started to talk about his idea which was on the teacher's side.)

Teacher B: Excellent!! John gave us a very good viewpoint on this issue. Many of you are discussing the relationship between corporal punishment and students. But John's idea is focused on the teacher's side. It is really helpful and we should learn from it. When we meet a problem, we should make a judgment by analysing it from different points of view.

School C: Teacher C, Teacher D and Teacher E

During the art course, Teacher D only encouraged the children when she identified their artworks. This indicates that she did not accept that all the children were creative or imaginative, but only praised those who reached her standards or satisfied the traditional criteria. Although Teacher D had a very strong personal perspective of the artwork, the children who received encouragement or praise from her seemed to be more confident; on the other hand, those children whose artwork did not find favour with Teacher D seemed to be a little upset.

[C-T4-AR01-0002-0910]
> *Teacher D walked around in the classroom to look at the children's drawings in progress*. <
Teacher D: Wow… These two buildings in your pictures look amazing! I want to move inside! Wow… it also has the wings. Well done!!!

[C-T4-AR01-0002-0600]
> *Teacher D took one child's picture and shared it with all the students in front of the classroom*. <
Teacher D: Look! The colours in this picture are full and varied. Betty you did a good job!! Very beautiful picture. But there is only one point you should improve on, that is the part with the sun…(Continued to give advice on how the child can improve her work)

If some work was not completed well and some children laughed or behaved in a negative way such as hissing and booing, Teacher D stopped it and encouraged those children to produce better work.

[C-T4-AR01-0002-0940]
> *Teacher D took one child's picture.* <
Children: (The voice) Booo……
Teacher D: Attention! You cannot use this kind of behaviour to comment on

another's work. Everyone has good points but also bad points. We should respect everyone's work. Eddie, I believe you will complete a wonderful picture. Don't worry, you have time! Just try and make it the best you can!

Moreover, the data showed that Teacher C did not provide many opportunities for children to speak in the Chinese language course, but she gave them more space and time when she taught the Integrated Curriculum course. Since the topics of the Integrated Curriculum course were more varied and the schedule was more flexible, Teacher C was more relaxed and willing to give the children more chances to express their ideas. In addition, before the children finished their work, Teacher C would provide comments about each team's work in front of all the students and then ask them to improve it. However, she not only provided comments for improvement, but also encouraged the children when they did a good job.

[C-T3-IC01-0002-0001]

> *Teacher C showed the work of each team in front of all the students. Based on the work, she gave a clear comment on the good points and the points where the team could improve their work. Teacher C mentioned a lot of weaknesses but she also provided encouragement and parsing if the headline, illustration or typesetting of the product was good.* <

> *The video showed that children were focused on appreciating others' work.* <

It can be seen from the above data that feedback from teachers or classmates had a positive impact on the children's willingness to express their ideas or have more courage to pose their questions during the lessons. This implies that more positive encouragement from teachers, rather than comfort, could enhance children's creative learning process.

6.3.3 Different approaches to instruction in the courses

Based on the data collected for this study, the six teachers in the three primary schools investigated in this study used three different types of instruction. Most of the teachers in the Taiwanese primary education system are used to utilising didactic instruction during their teaching because this is a traditional teaching method and is also the most effective way to maintain order in the class. It is basically a product of the Chinese examination-focused culture and parents' high expectation of their children's learning outcome, which puts pressure on teachers to change their pedagogical approach to ensure that their students learn what is needed to pass the exams in the shortest possible time (Vong, 2008).

However, some teachers like to use different materials to enrich their teaching and also provide children with knowledge that is not found in textbooks, but is related to society or daily life. Teachers also used scaffolding as a form of instruction to support children to find answers or develop their knowledge in the class.

(1) Didactic instruction

School A: Teacher A-1

Teacher A-1 in school A usually used didactic instruction in courses related to language, mathematics or some particular knowledge she wanted to build up quickly in the class. For example, she usually used the didactic method to explain words or sentences when she needed to teach the meanings and definitions of Chinese words in the Chinese language course. In addition, she used didactic instruction after children's individual learning activities in order to announce the correct answers to the questions in a short time and make sure that every child received the information she wanted to deliver.

[A-T1-CH02-0022-1130]

>Teacher A-1 explained the important words in the textbook. After the explanation, she also asked children to write the definitions of these important words in the book. <

>Repeat this process to finish all important words. (Teacher taught, children listened)<

[A-T1-CH03-0024-0739]

>Teacher A-1 finished lesson 7, started to teach the language-integrated activity 2 in the textbook. <

> Teacher A-1 used the didactic instruction to explain the content of language-integrated activity 2 in the textbook. (Children sat and listened) <

[A-T1-CH04-0034-1228]

>Teacher A-1 asked children to finish lesson 7 in the Chinese exercise book individually. There was no discussion between children and teacher. <

Teacher A-1: (10 minutes later) OK, now we are looking at the first part of exercise book. It is the abstract of paragraphs in lesson 7. I will tell you the correct answer, please take out your book and listen carefully.

Moreover, didactic instruction could also be used to establish a clear learning purpose during the lessons so that the children would receive clear and definite instructions for the learning activities.

[A-T1-IC03-0056-0350]

>Before the written work, Teacher A-1 explained the criteria for judging the quality of children's written composition. <

Teacher A-1: Well, This composition, I hope you could all achieve the aims as follows. Firstly, making a clear outline of each paragraph. Secondly, using fluent sentences. Thirdly, do not write any wrong words. Finally, being more creative and imaginative in your writing.

Teacher A-1 also used this method to check the children's learning progress, which was very important. She usually walked around the classroom while the children were

doing their work individually and if she found that some of them needed help, she provided support or gave them a hint to help them to solve their problem.

[A-T1-IC03-0058-0250]

> After the explanations about the aims and the content of the written work today, teacher A-1 started to lead the children to discuss the issues in the work sheet which could help them develop an outline of their written work.<

Teacher A-1: OK! Now you could start to write the outline of your written work by using the hint questions we discussed before. (Children start to write their outline and teacher walks around the classroom and provides a quiet space for the children to finish their work.)

> As the children were doing their work, teacher A-1 walked around and checked their progress. <

[A-T1-MA01-0016-0730]

> Teacher A-1 asked the children to answer the questions in the textbook individually. She did not allow them to discuss the questions with each other, but she walked around the classroom to check their answers. <

[A-T1-MA02-0031-0020]

> Teacher A-1 asked the children to finish Pages 50-51 in the Maths exercise book individually. She did not allow them to discuss the questions, but she walked around the classroom to check their answers. <

School B: Teacher B

It was evident from the classroom observation in school B that teacher B usually used didactic instruction at the beginning of the courses. Since the children needed to learn a great deal of new information, teacher B used worksheets he had designed himself, along with PowerPoint slides, to introduce the new concepts to them. For example, the children would be required to participate in a formal debate competition at the end of term; therefore, they needed to use this term to learn how to prepare for and participate in this competition. This is why teacher B used didactic instruction at the beginning of the course to provide a detailed explanation of the rules of the debate

competition. Moreover, because the children also needed to prepare and develop their perspectives for the debate, teacher B aimed to teach them how to use different thinking hats, not only to construct their ideas, but also to collect relevant information. He clearly defined the important points related to thinking hats in the worksheets and on PowerPoint slides and explained them in the class.

[B-T2-LN01-0002-0030]

Teacher B: Okay…(Showed the Power Point) Now, I will explain the rules in debate competition. First, we need to …..

> *Teacher B started to explain each rule using the PowerPoint.* <

[B-T2-IRB02-0012-0600]

Teacher B: Now, this part is about the data analysis. So…..What is "Data Analysis" ?…(Showed the Power Point, the definition of Data Analysis) Please read it together!

> *Children started to read the definition aloud.* <

Teacher B: Very good! When we collect our data, we will start to analyse it…For example….(Teacher B referred to previous research in France-"the relationship between the probiotics and mice" as an example to explain the processes of doing data analysis.)

In addition, teacher B required the children to copy all the text from the PowerPoint slides in the class and he checked their worksheets for confirmation. This is another customary teaching approach used in Taiwanese primary schools.

[B-T2-LN02-0004-0910]

Teacher B: Please read the work sheet Page 3. (Showed the PowerPoint)

> *Children started to read the sentences on Page 3.* <

Teacher B: Now, please look at the screen. You must know what rules we should obey in the debate competition. (Pointed at the right part of PowerPoint) Look! There is some additional information for each rule. Please write it down on your work sheet.

S_Tim: Should we write it below the part about "the rules of debate competition"?

(He pointed at his working sheet.)

Teacher B: Yes! Everyone must write it on your work sheet. (Then, teacher B gave them 3 minutes to complete the note writing.)

[B-T2-LN02-0005-1320]

> *After the explanation for the rules of debate completions, teacher B showed a new PowerPoint slide.* <

Teacher B: Okay...Here are the important points which we are talking about in today's lesson. Please read these points.

> *Children started to read the sentences on the Power Point. Then teacher repeated it and emphasised some points that the children might ignore in the future.* <

School C: Teacher C, Teacher D and Teacher E

There is a great deal of evidence that the teachers in School C used didactic instruction at the beginning of the lessons or when they needed to maintain order or give clear explanations to the class. Teacher C, Teacher D and Teacher E in School C used two kinds of teaching methods within didactic instruction. Based on the data from School C, they gave straightforward instructions in their lessons to maintain order or direct the children to complete the learning activities in the way they asked. This kind of teaching method proved to be very effective and the children learned the new topics successfully or completed the tasks in a timely manner if they followed the teacher's instructions.

[C-T5-SC01-0002-1200]

> *Before the children performed the experiment, Teacher E provided clear orders to the children.*<

Teacher E: Now, the No.1 student in the group takes the straw and puts it on the paper which I gave you.

> *Then, Teacher E continued to give a clear request to the specific children in the group and led them to complete the experiment.* <

[C-T3-SO01-0002-0200]

> Teacher C started to divide the children into groups for the field trip next week. She did not allow children to choose their partners by themselves. <

Teacher C: Now, I would like to inform you of the group lists for the field trip next week. I will also assign the group leader for each group. Please notice you should always be with your group during the whole field trip.

[C-T3-SO01-0002-0420]

> Teacher C explained the teaching topics for today's lesson. <

Teacher C: Today we are talking about learning certain skills. The skills are…. (She started to give an example to explain the topics. The children were quietly listening to the teacher's instructions.)

[C-T3-SO01-0002-0615]

Teacher C: Now, please read this paragraph loudly.

> Children started to read the paragraph loudly. <

Teacher C: Okay, now, take your coloured pen and circle the key words which I will read out.

> Teacher C gave an explanation for each key word and also provided examples from daily life to help the children understand the concepts.<

[C-T4-AR01-0002-0312]

Teacher D: You can use the following materials to complete your picture: Colour pens, crayons and water colours. But you should use the water colours in the final step.

[C-T4-AR01-0002-0840]

> Teacher D usually pointed out directly the wrong parts that children needed to correct in front of all the students. She asked the children to draw the sun according to her instructions. <

Teacher D: (Took one child's picture, spoke to all the children) Look! This is not successful work. Because the colour should…. (She started to describe the points she thought are not good and asked the child to correct these.)

> Teacher D also taught the children the different methods of compositions but did not have any interaction with the children while teaching. Some children did not focus on the teacher's teaching. <

[C-T2-CL01-0002-0220]

> *Teacher C mentioned that the children will need to write their written work after the field trip to the National Taiwan Science Education Center.* <

Teacher C: Okay, so, if we change the location to Taipei botanical gardens. What points will you put in your written work?

> *The teacher did not let the children answer the question. After she posed the question, she gave clear instructions to tell the students about what points they should and should not put in their written work. She also provided many examples for children to prevent making mistakes in their written work.* <

[C-T2-CL01-0077-0012]

Teacher C: Please write down the key words I told you before in your textbook. (Waited for 2 minutes) Okay, now please check the textbook with the person who sits next to you. Everyone should write these words in the textbook.

Teacher C: Okay, now… let's open to page 43 and finish the third part together.

> *Teacher C started to explain the questions one by one and then announced the correct answer. She left some time for the children to finish it. During this period, she walked around and checked the children's answers in their textbooks.* <

[C-T2-CL02-0077-0001]

> *Teacher C used a PowerPoint presentation to teach the stroke order of new Chinese characters in this lesson.* <

Teacher C: Attention, now please raise your hand, and then follow the stroke orders. I will observe who did not do it correctly.

> *After the children practiced the stroke order, Teacher C used the PowerPoint to explain the meanings and how to use the characters to make words. During this teaching activity, Teacher C only used didactic instruction. After the explanations for each character, she asked children to practice in their work books.* <

(2) Multimedia instruction

School A: Teacher A-1

Teacher A-1 appeared to be passionate about enhancing children's creativity and imagination. Since she believed that children require sufficient background knowledge to develop their creativity, teacher A-1 focused her attention to enriching

her teaching and providing the children with as much information as possible. Hence, she used a variety of materials, such as books, videos or news articles, to improve the children's comprehension of different topics in the lessons.

[A-T1-IC01-0047-0800]
>This class was about 'Understanding the different resources of energy'. Teacher A-1 prepared many different materials to support the teaching and learning of this topic. She used two books: "Seekers" and "Magical resources of energy"; and three videos: "Stirling engine", "Ocean Energy" and "Wind Energy". <

[A-T1-IC02-0049-1032]
>Continued with IC01, Teacher A-1 prepared many different materials to help develop children's understanding of different forms of energy. In this lesson, she used a video about "biomass energy" and a TV news item (from YouTube) about "Building a wind-driven generator in house". The children appeared very interested in watching these videos. <

>After watching these videos and books, the teacher gave the children a work sheet. There were some questions about energy resources. Firstly, teacher A-1 led children to read the questions aloud. Then, she started to explain each question and to discuss them with the children. <

In addition, teacher A-1 designed a worksheet to help the children to understand the key points of the lesson. In a short interview after the class, teacher A-1 confessed that it took a great deal of time to prepare these different teaching materials, but she enjoyed doing it for her students.

School B: Teacher B

Teacher B of the talented class of school B was able to be more flexible in designing his courses and using his time and space in the classroom than the teachers who taught the standard classes. He usually designed worksheets for the children to use at

the beginning of the class, and then he used PowerPoint as the main teaching material. Moreover, he used books, newspapers, photos and videos as supplementary materials. For example, when teacher B talked about how to reverse one's thinking, he showed a picture from the book "The Little Prince". When he asked the children 'what does it look like?' he received a range of different answers. In the record of the classroom observation, the children looked very excited and seemed to be interested in finding the answer.

[B-T2-LN03-0037-0450]

> Teacher B introduced the issue by using PowerPoint. The Topic is "To reverse your habits in thinking about problems". <

>There is a picture on the Power Point slide. <

Teacher B: Could you tell us what you can find out in this picture?

>4 children raised their hands and wanted to answer but teacher B did not let them speak immediately. <

[B-T2-LN03-0037-0840]

> Teacher B showed the topic they would discuss-"My Six Thinking Hats" on the Power Point slide. <

>He gave children the work sheets and started to talk about each thinking hat. <

[B-T2-IRA01-0008-0106]

>Teacher B gave children 20 minutes to read the research projects which had been done by previous students in the talented class of school B.<

Teacher B: Ok! After reading these projects, could anyone share with us what research you are interested in?

[B-T2-IRB01-0011-0001]

>Teacher B used many previous studies and news related to the research questions and topics. <

> These examples seemed to engage the children's interest as they were very focused on listening and also liked to express or discuss their ideas about these research questions and topics.<

[B-T2-IRB03-0043-0600]

>*Teacher B used a recent hot news topic as an example. The news was about adulterated oil.* <

Teacher B: We all know that there is a big story about adulterated oil. If we want to do research about this issue, could you tell me what topic you would like to do and what research questions you would propose?

School C: Teacher C, Teacher D and Teacher E

When comparing School C with Schools A and B, the evidence shows that scaffolding instruction is used less frequently in School C than in the other two. The teachers in School C sometimes used questions to lead the children to find answers. During the science course, Teacher E did not announce the correct answer directly after providing many children with time and space to express their ideas, but posed more questions to guide them to think more deeply.

[C-T5-SC01-0002-0540]

> *Teacher E pressed and made the balloon transform by using his hand.* <

Teacher E: Well… so could you tell me why the balloon transformed?

S_Lin: It is blowing…

S_Judy: It might have a whole…

Teacher E: Why do you think it might have a whole?

[C-T5-SC01-0002-0730]

> *Teacher E took out many syringes then pointed to one syringe.* <

Teacher E: What is inside this syringe do you think?

Children: Air!!!

Teacher E: Are you sure it is air inside this syringe?

Some children: Water…..

Teacher E: (took another syringe which is filled with blue liquid) How about this one?

S_Alice: Water and water colour pigment.

S_Luis: Seawater.

Teacher E: Alice's answer is correct. There is water and blue water colour pigment in it. (took another syringe which seemed empty) How about this one?

S_Tim: Um….I don't know….

S_Ben: Air.

Teacher E: The answer of "I don't know" is better because we are not sure what's inside until we perform the experiment for confirmation.

Although Teacher D usually used traditional teaching methods in the art course, she sometimes used questions to elicit more possible answers from the children. They seemed to be more interested in finding the answers when she posed questions and were more focused than when they were only listening to the teacher's instructions.

[C-T4-AR01-0002-1440]

Teacher D: When you are drawing the trees in your pictures, you should think about it. What is the tree's colour? Is it always green?

S_Alice: No, some trees are yellow.

Teacher D: Yes! And did you find that there are some trees that become red? Do you know what kind of tree that is?

Children: The maple tree.

Teacher D: Good! So… You should understand that there might be many different colours of trees. Not just green.

In addition, Teacher C sometimes used scaffolding instruction during her lessons. She not only posed questions to build on the children's knowledge, but also used teaching methods like mind maps in her teaching activities. She also connected the concepts in the different fields or subjects in the hope of enhancing the children's understanding of them.

[C-T3-CL01-0002-0510]

> *Teacher C started to draw the mind map on the black board to explain the structure of the lesson she taught today. She also asked children to write down the mind map in an empty spot in their textbooks.* <

[C-T3-CL03-0002-0519]

> *When Teacher C introduced the new words which are related to mathematics, she would also make a connection between these and organise them, and then wrote them on the blackboard.* <

[C-T3-CL03-0002-0840]

> *Teacher C introduced the new characters in the lesson.* <

Teacher C: Okay, let's move on to this new character. Could you tell me whether there is any character which also has the same pronunciation as this one?

(3) Scaffolding instruction

School A: Teacher A-1

How to support children to develop their knowledge is also an important issue for teachers in primary education. According to the data from School A, teacher A-1 sometimes used scaffolding instruction in her lessons. She usually posed questions to students or asked follow-up questions after they responded to lead them to understand concepts correctly. This enabled the children to practice their thinking skills and build their knowledge in the correct way.

[A-T1-IC04-0060-0510]

>*When children completed their composition individually. Teacher A-1 sometimes asked them some questions in order to help them construct their ideas.* <

Teacher A-1: Hello, please listen to me. Let me ask you a question. Do you think you will see many road signs when you go out with friends in the future?

S_Jack: No, I don't think so.

Teacher A-1: Why? Why do you think that?

S_Jack: I think the car will have the navigation and will drive automatically.

Teacher A-1: So…. you think the car will have the automatic navigation…. How do

you think that people themselves will also have…?

S_Jack: Yes, people might also have the navigation on their body.

S_Jimmy: Or people will have some equipment to prevent them getting lost.

Teacher A-1: These ideas sound very interesting. (Facing Jack and Jimmy) You could describe more details about this idea. (Facing all the children) Everyone could try to practise this kind of questions. It could be helpful for developing your ideas.

Similarly, teacher A-1 reminded children of information they had learned before to help them to solve problems and develop their knowledge. She usually used many "WHY" questions for the children to reflect on their ideas.

[A-T1-MA01-0017-0300]

> *Teacher A-1 led children to discuss the questions in the textbook.* <

Teacher A-1: Could you tell me what's the number of angle A and angle B? You could use the protractor.

S_Johnny: I don't need the protractor. I can calculate these two angles.

Teacher A-1: How could we calculate? (Many children want to speak.) OK…. Let's do it together. Following the theory of triangle, the total of three angles is 180 degree and now we minus one angle- 90 degrees, equal????

Students: 90 degrees.

S_Johnny: And it needs to divide by 2.

Teacher A-1: Why do we need to divide by 2?

S_Johnny: Because the lengths of two sides in this triangle are the same, like a half of a square.

School B: Teacher B

Teacher B posed a great many questions during the lessons to help children to develop their ideas or find the correct answers. Therefore, teacher B did not usually present the correct answer directly. When children's ideas may be incorrect or they had failed to consider important aspects of the issue being discussed, teacher B asked more 'Why'

and ‘How’ questions.

[B-T2-LN02-0004-1410]

>*Children discussed the previous survey of “Happiness”.* <

Teacher B: Ok! So… according to your discussion about how to measure happiness, you mentioned that we could use quantitative research. Do you mean that people could use a number to present the level of happiness they feel?

Children: NO….

S_Ben: Because everyone has a different definition for happiness…

Teacher B: Good! There could be different definitions of happiness. Therefore, we could find in the previous studies. There was not only one dimension in the study. The survey usually includes many dimensions in order to obtain the reality of happiness. For example, we could investigate people who have different social backgrounds …….

[B-T2-LN04-0039-0540]

>*Teacher discussed the issue of collecting resources. Children mentioned that they could find the data from the Internet, such as Wikipedia.* <

Teacher B: So…there are three articles we found, one is the previous academic research from National Taiwan University, one is the article from Internet Wikipedia, and the last one is the article from the Internet blog. Which one is the best reference?

Children: The research from National Taiwan University.

Teacher B: Why?

S_Tim: Because National Taiwan University is a very good university in Taiwan, their studies must be good quality. So we should use it…

Teacher B: But Wikipedia is also very very popular and many people use it on the Internet. Why you did not choose it?

S_John&S_Ben: Because everyone could edit the content of Wikipedia…

Teacher B: Ok! Because you mentioned…… (teacher B started to summarise the children’s ideas and gave more explanations about this issue.)

[B-T2-IRA02-0042-0600]

>*Teacher B asked every student to answer the five research questions which were shown on the Power Point.* <

S_Tim: I think the answer to question no.3 is the experimental design.

Teacher B: Why did you choose the experiment in your research method?

>*S_Tim tried to talk about his reasons and also gave an example to support his viewpoints.* <

>*After the children had spoken, teacher B summarised their ideas and used more examples to add information. Then, he provided a conclusion for the discussions.* <

[B-T2-IRB04-0045-1300]

Teacher B: The research topic is about "the type of teachers who are popular for children in the school." Could you tell me which research method is suitable for this topic?

S_Alice: We could use the questionnaire method.

Teacher B: How to design the questionnaire for this study?

S_Alice: Well….. We could use the questionnaire to ask the students what kind of teacher they like…. Do they like the humorous teacher? Or the strict teacher? Or the teachers who are laissez-faire?

Teacher B: Very good! We could …… (Started to explain more details…)

School C: Teacher C, Teacher D and Teacher E

In the classroom observations in School C, Teachers C and D usually used the teaching materials provided by the textbook company. For example, Teacher C used Power Points of the lesson's contents, which included animations for teaching the stroke order of each character, the structure of the lesson, or a video for supplying information about social or cultural issues related to the lesson.

[C-T2-CL02-0077-0001]

> *Teacher C showed the PowerPoint to teach the stroke order of new Chinese characters in this lesson.* <

Teacher C: Attention, now please raise your hand then follow the stroke orders. I will observe who did not do it correctly.

[C-T2-CL02-0077-0230]

> *Teacher C showed the video of the story which was related to the new character.* <

Teacher C: Now, please be quiet and watch this video carefully. I might ask you questions about this video.

There was much evidence in this study that the teachers constantly adapted their teaching methods to match the teaching topics or the children's reaction in the classes; at times it was appropriate to use didactic instruction to impart certain information, and teachers justified this. Didactic methods have been more prevalent in the Taiwanese school system historically, but with the introduction of creative teaching policies, the data show a wider range of approaches deployed by teachers, such as open ended questions and scaffolding which promote children's PT, problem solving and creativity and imagination during learning activities. Although I have identified three main approaches in my analysis, in practice teaching is a more nuanced mix of methods.

6.4. Creating a positive learning environment

It is important to create a positive, friendly and open learning environment for children to enhance children's creativity (Craft, 2005; Cremin, 2015; Jeffrey, 2006). Children who feel confident and comfortable in their learning spaces may become more creative in their learning. Besides, the environment is not only a space or place, but it also includes the climate teachers construct to enhance children's learning. Therefore, the discussion in this section will centre on the pedagogy teachers used during the class. Three issues emerged from the data, namely, teachers' open mind and patience in the class, the opportunities for the children to speak and the encouragement provided by the teachers.

(1) Teachers' open mind and patience in the class

The children were sometimes very excited about some of the topics during the class and they were eager to share their experience or ideas with their classmates. Although some of the topics were not particularly relevant to the lesson, it was still a good chance for children to express their thoughts. Therefore, the learning space became more positive and open if the teacher was patient and provided the children with opportunities to talk.

School A: Teacher A-1

For example, in the Chinese language class, teacher A-1 talked about the experience of visiting a neighbour. Amy raised her hand and wanted to share her experience. She said her cat had visited her neighbour and caused a strange situation. Many children asked questions or engaged in dialogue with her as she talked. Teacher A-1 was very patient in listening to the children and giving them positive feedback, such as 'Wow, that is really an interesting story.' 'You must have been very excited to see that.' The learning climate was very friendly and open and the children seemed to be enjoying the conversation very much.

Moreover, there were two examples in the integrated curriculum course.

[A-T1-IC03-0057-0700]

> Teacher A-1 gave the work sheets to the children. She asked them to read individually for three minutes, and then started to lead them to finish it. <

Teacher A-1: Could you imagine what kind of house we will live in the future? What will the environment around the house be like? Is it possible that we will not see dogs anymore?

S_Jimmy: Maybe there will not be any dog poo any more.

S_Pam: I think we might step on many screws everywhere.

Teacher A-1: (Very surprised) Screws everywhere? It sounds very interesting. Could you tell us why you think there will be many screws in the future?

Based on the above evidence, teacher A-1 listened and allowed the children to express their thoughts. She was open-minded and accepted different ideas from the children and she also tried to lead them to talk more about their thoughts.

[A-T1-IC04-0059-0645]

> *After the discussion about human behaviours in the future, one child said he thought people would eat soil in the future because of no food.*<

Teacher A-1: Well, we talked about there might be food shortages in the future. Do you think that our future will be short of supplies? What kind of food will be gone? But, dear, we need to remember we are imagining the "possible" future, not the negative future. If we believe the future world will be terrible, we might be pessimistic. Therefore, we could think about it. Sam said that the earth would still have soil in the future. But WHY would people need to eat the soil? Does it mean that people change their eating habit? Or does it mean that we will not have any food in the future? It gives us a good point to think more deeply.

It is evident from these words of teacher A-1 that she not only allowed the children to express their thoughts, but she also asked them more questions or expressed other points of view to enhance their thinking. She used many questions beginning with 'What' and 'Why', but the atmosphere in the classroom was very open and not at all serious because the words of teacher A-1 were usually very kind and gentle. This may have helped the children to feel at ease and be willing to follow the teacher's lead during the lesson.

School B: Teacher B

Teacher B prepared different topics for the children to discuss in the lessons in the talented class of school B. Moreover, the children in the talented class also liked to express their ideas or thinking during the teaching activities. Teacher B was usually open-minded and patient in listening and providing space for the children to develop their ideas. For example, many children were keen to express their ideas during the class and teacher B provided every child who wanted to talk with the opportunity to speak in the lessons, whether the ideas were right or wrong. He also summarised the ideas and give a clear but short conclusion after the children had spoken.

[B-T2-LN01-0039-1040]

> *Teacher B introduced the white thinking hat and explained what it was in the class.* <

Teacher B: Okay…. Now we assume if we need to plan our graduated trip. Please wear the white thinking hat. Could you tell me what's the first point we should do?

>*Many children raised their hands and wanted to speak.* <

S_Tony: Collect the relevant information for the trip.

S_Pamla: We should find where we want to go.

S_Ben: The date for the trip.

S_Ray: Relevant blogs, news or articles which could help us to gain more information.

S_Alice: How much we might spend because we need to prepare enough money.

S_Nina: Safety and maybe there is some different culture we need to notice.

>*While the children were speaking, teacher B made notes on the white board for organising students' ideas.* <

[B-T2-LN04-0040-0610]

> *Teacher B introduced and explained the black thinking hat in the class.* <

Teacher B: So… Now we are talking about the issue of "Teachers cannot do corporal punishment in school". Please wear the black thinking hat, then tell me what the disadvantage are for this issue?

>*Many children raised their hands and wanted to speak and teacher B let them speak one by one.* <

>*While the children were speaking, teacher B made notes on the white board for organising the students' ideas.* <

>*When children finished their speaking, teacher B started to analyse their ideas and gave a short conclusion for this issue.* <

[B-T2-IRB02-0012-0420]

> *Teacher B discussed the previous experiment design in the class.* <

Teacher B: Well, now we understand that previous experiment. Now, could you tell me what will you design if you need to do this experiment?

>*3 children raised their hands and wanted to speak. Teacher B let them speak and provided a short conclusion for each child's ideas.* <

Besides being open-minded, teacher B was very patient with his students in school B. He usually listened attentively to what the children had to say and provided an open and friendly learning atmosphere and space in the classroom. For example, if children were sometimes unable to respond to teacher B's questions immediately because they needed more time to think, he did not push them to give an answer. Instead, he gave them more time and encouraged them to express their ideas.

[B-T2-IRB01-0011-0350]

Teacher B: OK, could anyone tell me what are the research design or research methods you found before?

>*Most of children were quiet and no one raised their hands. Teacher B did not push them to answer. He concentrated his attention and looked at every child and waited for them to speak.* <

>*After 15 seconds, S_Joe raised his hand and expressed his thoughts.* <

[B-T2-IRB03-0044-0650]

>*S_Mandy tried to express her ideas about the topic. Although she was a little nervous and took some time, teacher B was still very patient to listen until the child finished talking.* <

>*Then, teacher B gave some feedback for her idea and also provided another question which related to S_Mandy's idea in order to encourage all students to think about it.* <

Moreover, children sometimes focused on the wrong content or expressed ideas that were unrelated to the lesson, but teacher B was still very patient and listened to their words. He respected the children for speaking and tried to make a connection between what they said and the issue being discussed in the class.

[B-T2-IRB02-0013-0930]

>*Teacher B talked about a previous research project was about customer behaviour between the free and paid Apps for mobile phones.* <

S_Tony: If you buy the paid App, you could play more game levels than the free one.

S_Una: Or you could have different functions you can use. I bought one game……

>*Child S_Una was very excited to share her experience in playing the paid game App. Other children were also interested in this issue and joined the discussion.* <

>*The discussion lasted for more than 8 minutes. Although it was not highly relevant to the topic that the teacher wanted to discuss in the class, teacher B was still very patient to listen and did not interrupt the child.* <

Teacher B: (when S_Una finished her words) Well, the discussion between you all is also a good example for doing the research project. You could try to find the reasons why people choose free or paid Apps. So….

In this example, teacher B did not interrupt the children. This may have been because there were only 8-10 children in one course, so that there was enough time for the teacher and children to have a discussion. Besides, teacher B was usually very patient and gave the children enough chances to express their thoughts because he hoped they could develop their ideas. Furthermore, if children misbehaved in the class, teacher B would give them a chance to explain their reasons for doing so.

[B-T2-LN03-0037-0240]

>*S_Tony was late in the class.* <

Teacher B: Tony, could you tell us why you are late?

>*S_Tony started to explain the reasons. Teacher B was very serious but patient in listening to Tony.* <

School C: Teacher C, Teacher D and Teacher E

Based on the classroom observation in School C, Teacher E was usually open-minded and patient in the science class, but Teachers C and D were usually serious during their courses.

During the science class, Teacher E usually used a great many questions and daily life experience to increase the children's interest. The data also show that the children were more inclined to express their ideas when the teacher talked about issues related to their daily lives or previous learning experience. In addition, Teacher E usually provided an open-minded and friendly climate in the science class. This open and supportive learning environment also had a positive influence on children's creativity. According to Cremin (2015), it is important for teachers to balance freedom and structure in the pedagogical environment and use playful/game-based approaches that enable children to own their learning. Therefore, a supportive and open learning climate can increase children's interest in learning and encourage them to become more engaged in the course.

[C-T5-SC01-0002-0330]

> *Teacher E took out one balloon which he also used in the class last week.* <

S_Luis: teacher… I bit my balloon and it was broken…

> *Other children laughed in the class.* <

S_Tony: teacher… my balloon was deflated …

Teacher E: (Smile) Well…. Now we know you are the balloon killers. Okay, so,

how many of your balloons are alive?

>10 children raised their hands. <

Teacher E: (Looked at Tim, who raised his hand) Is your balloon still alive? Has it become slimmer?

S_Tim: Ya… I think so…

Teacher E: (Looked at Andy) How about yours?

S_Andy: I used it to make the Nunchaku shape.

Teacher E: (Smiled) Wow… so it transferred…. (Looked at Vanessa) How about yours?

S_ Vanessa: Mine is very normal like before.

Teacher E: (Surprised) Really? Your balloon still has elasticity and looks very glossy?

Other children: No way…..

In the last example, Teacher E usually smiled and was patient when listening to the children speaking. His body language also made the children feel more comfortable in the class. Moreover, when the children could not immediately answer his questions, teacher E was patient and gave them time and space to respond. If no-one could answer the question, Teacher E used more questions to help the children to express their ideas.

[C-T5-SC01-0002-1500]

> Teacher E talked about the piston motion of syringe. <

Teacher E: Could you tell me another tool which also uses the piston motion in our daily life?

Children: Hospitals…. Doctor….Health Centres…

Teacher E: No no no….I mean…the tools… not the occupation.

S_Jim: The pump which we use to fill the balloons.

Teacher E: Very good….?Any more ideas?

> No one answered. It was very quiet in the class. <

Teacher E: Well… did you see the traditional train before?

Children: YES!!! Oh…I see….

In summary, an open and supportive environment is essential for children's learning, since it can make them feel more comfortable to develop their ideas or engage in activities. The environment is not only a 'place' or 'classroom', but it also involves the atmosphere, the interaction between the children and teacher or children and children. It can be a really supportive place with many learning resources, but it can also be the climate created by the teacher and learners.

(2) Standing back and providing support

Craft et al. (2012) indicate that there are three strategies that can enhance children's PT one of which is "Standing back". This is one of the important elements of pedagogy to enhance children's PT, since it means that it would be possible for children to think during their learning if teachers stand back and give them more space to develop. However, this does not mean that teachers should leave children to deal with the problems they encounter during learning and do nothing to help them. Teachers should still provide support when children ask for it or they think they might need it. Therefore, a pedagogy of standing back and providing support can be combined to give children more opportunities to develop their ideas or find ways to solve their problems.

School A: Teacher A-1

The classroom observations showed that teacher A-1 used the pedagogic strategy of 'standing back' when children did the activities individually in the lessons. Children may have different learning activities in different situations, such as group work or individual work. In addition, the teacher usually provided them with a clear explanation of the aims of the activities before they started. The children were able to

complete the work themselves or by group cooperation.

[A-T1-IC03-0058-0250]
> After explaining the aims and the content of the written work today. Teacher A-1 started to lead children to discuss the issues on the work sheet which could help them develop an outline of their written work. <

Teacher A-1: OK! Now you could start to write the outline of your written work by using the hint questions we discussed before. (Children start to write their outline and teacher walks around the classroom and provides a quiet space for children to finish their work.)

[A-T1-IC04-0059-0138]
>Teacher sits on her seat and gives the children the time and space to finish their work. But children were able to ask the teacher questions individually if they needed to. <

[A-T1-IC04-0059-1300]
>Teacher walks around in the classroom to monitor the children's progress, but she does not interrupt their work. Then she goes back to her seat and calls some students up to check their progress one by one. <

In addition to standing back when the children needed time and space to concentrate on their work, teacher A-1 also provided plenty of support when she found that children may need help to build their knowledge. Asking leading questions and connecting concepts to relevant life experience were the two most common strategies frequently used by teacher A-1 in her courses.

[A-T1-CH02-0021-0135]
> Practice in using "firstly" and "secondly" to complete Chinese sentences<
Teacher A-1: So… let's practice! If we want to be the champions in the aboriginal dance competition (connected with the life experience, children will attend that competition one month later). Firstly, we…..

S_Jane: need to make well preparations.

Teacher A-1: ok… firstly, we need to make good preparations. Secondly, we….

S_Jimmy: we would pay the price for it.

Teacher A-1: (Did not respond directly) (Providing a hint) we should have good group……

Students: Group cooperation.

Teacher A-1: Yes, you are right. Secondly, we need to have good group cooperation.

[A-T1-IC01-0048-0920]

>Teacher A-1 uses a video to expand children's knowledge. During the video viewing, because the teacher is concerned that children might not understand the content of video, she would interrupt the video and make some points to help the children to understand what the video is about. <

[A-T1-IC03-0057-1000]

> Teacher A-1 points out some old things for examples and analyses the strengths and weaknesses. She hopes children could avoid stereotypes and try to think of any possibility about the topic. <

Teacher A-1: Therefore, we should pay more attention to it. Is it true that the old thing would be eliminated in our future?

It was found from the data collected for this study that teacher A-1 generally used oral support to help the children to learn. She used a great many questions to assist the children during the lessons because this was a relatively fast way to help them to understand how they could improve.

School B: Teacher B

Because the types of courses in the talented class were very different from those in the primary class, the teacher had more space to modify the content or have individual schedules for the children's progress. This meant that the teacher could afford to be more tolerant and less anxious if the learning outcomes were not always achieved according to the planned schedule. Therefore, teacher B gave the children many

opportunities to express their ideas orally, and he also stood back and was patient in listening to their words.

Based on the evidence from the classroom observation, many children wanted to express their ideas when the teacher posed questions in the class. Teacher B usually provided each child with an opportunity to speak and he listened carefully and patiently to what all the children said. He did not interrupt or correct their expressions immediately, but rather summarised their ideas. If some children misunderstood a question, he asked it again and provided additional information to clarify the meaning.

[B-T2-LN01-0002-0825]

> *Teacher B and students were discussing the topic "the different characters in the debate competition". S_Tony had different viewpoints from the teacher and other children. He was very persistent in his ideas.* <

S_Ben: I think the roles in the competition are very simple. Everyone only needs to be responsible for the tasks they are allotted.

S_Tony: (Very agitated, pointing at S_Ben with his finger) BUT!!! Okay… IF…If there are three people in the group who have the same viewpoints…. (Continue to talk...)

>*Teacher B provided the time and space for S_Tony to express his thinking. Other children were also listening.* <

>*When S_Tony finished speaking, S_Ben, S_Ray and S_Tom presented their ideas to contradict S_Tony's viewpoints. Teacher B still stood back and listened patiently to every child's views.* <

Teacher B: Okay…. It is a very good discussion. Now we try to organise your all viewpoints. Firstly, S_Tony talked about……

>*Teacher B did not point out the correct viewpoint directly. He tried to* summarise *every child's idea then told the children that the important issue in the debate competition. Then, he proposed one example to explain his viewpoint.* <

[B-T2-LN02-0005-0955]

> *After Teacher B read the first sentence on the Power Point, he asked children what it meant.* <

S_Ray: We cannot ask question any more.

>*Teacher B did not provide the correct answer.* <

S_Tim: It means that when you ask me "what does it mean", I cannot ask you 'what do you think it means".

Teacher B: Um……(S_Nina raise her hand)

S_Nina: Well, for example, if you asked me 'why do you need to go to the after-school class?' I asked you "Why do I need to go to the after-school class?"

Teacher B: (Confused) Um? Sorry…?

>*Teacher B Still provided time and space for children to discuss or declare their viewpoints.* <

S_Ray: (Responded to S_Nina) Do you mean that someone asks you why you need to go to the after-school class, and you asked "why do you want to ask me this question?" Isn't it?

S_Nina: No… I mean that I cannot ask the same question back to him/her.

Teacher B: Okay! I understand what Nina's saying. When someone asked you "Did you attend the after-school class?" We cannot ask him or her the same question- "Did you attend the after-school class?" If we did it, the conversation would never end. Very Good! All of you are doing a good job. Now we start to discuss……

Moreover, teacher B sometimes provided support when the children failed to understand the point of a question and gave an incorrect answer. He did not provide them with the correct answer, but gave them a hint or more questions to help them to find it. In addition, during specific learning activities which he had asked the children to complete individually, teacher B walked around the classroom to observe their progress and provide them with support if they needed it.

[B-T2-LN01-0002-0355]

> *Teacher B and students discussed the topic "the rule for presentation in the debate competition".*<

Teacher B: Now we understand the rule for presentations in the competition- "5 min, 5 min, 4 min" and there will be 5 minutes for the break. Could you tell me how much time will be spent in one debate competition?

>*Very quiet. Children were focused on finding and calculating the answer. Teacher B stood back and gave them the time to solve the problem.* <

Teacher B: You could read the work sheet. It contains the information and the rules for the presentation. You can review it.

S_Ray: 29 minutes?

S_John: 29 minutes…

S_Tim: Teacher….the constructive speech and cross-examination are both 5 minutes, right?

S_Tina: Is it "5 min, 5 min, 4 min"?

S_Ben: So, it is not the rule of "4 min, 4 min, 3 min"? (he pointed at another rules of presentation in the working sheet.) We need to use the rule "5 min, 5 min, 4 min" to calculate, don't we?

Teacher B: Yes, "5 min, 5 min, 4 min" is the typical and traditional rule for the presentation in the debate competition.

S_Ben: Will two teams propose the conclusion together?

Teacher B: I don't think they could propose together.

S_John: So each team has 4 minutes to do the conclusion.

Teacher B: So…. How much time will be spent in one debate competition?

S_Ray: 69 minutes.

[B-T2-IRB04-0045-0220]

> *Teacher B showed the Power Point which had five research topics. He asked children to choose the appropriate research methods which could be used for each topic. This was an individual task for the children.* <

>*When the children tried to find the answer for these topics, teacher B also walked around the classroom and provided support by asking more questions if he found someone might be having problems in answering the questions.* <

Teacher B: You can think about the previous studies you read before. There might not be only one research method used in the research.

Teacher B: To imagine that you are the researcher and will do this research…. You have this variety of methods that could be used. Which one will you choose, and why will you choose it? Think about it! Fighting!

>*Teacher B gave the children the time to complete the task. After they finished, he discussed the answers* with the whole class. <

School C: Teacher C, Teacher D and Teacher E

The evidence from the classroom observations in School C showed that the teachers stood back and provided time and space for the children to complete the learning

activities. For example, in the science course, Teacher E explained the process of the experiment and what the children needed to observe and then he gave them sufficient time to complete it and find the answers. During the experiment, Teacher E usually stood back and walked around the classroom. He still paid careful attention to the children because he needed to ensure their safety during the course.

[C-T5-SC01-0002-0100]
> *Children started to do the experiments.*<
> *Teacher E gave children 15 minutes to complete the experiments. During this period, he was walking around and observed the children's situation and each group's experimental progress.* <

Moreover, the teacher also provided immediate support and help if an emergency occurred during the course. If there was some inappropriate behaviour in the class, the teacher stopped it and gave a serious talk to the children to prevent it from recurring.

[C-T5-SC01-0103-1450]
> *Children continued to do the second experiment.*<
S_Dany: Teacher, the water spurted into his eye!!!!
> *Teacher E came to see the child immediately. Many children stood as onlookers and were also gathered around that child. After checking the child's situation, the teacher asked the children to go back to their seats, then made an announcement.* <
Teacher E: Attention, please! Just before, Jim's eye was hit by water when he did the experiment. Please be aware and very very careful with every step in the experiment. Fortunately, his eye is not hurt because we used water as the liquid in our experiment. It would be very dangerous if the liquid was not water. So, please make sure you follow my instructions and do not play during the experiment. OK?

In addition, Teachers C and D supported the children's work during the lessons in the form of comments or judgments. They usually supplied very clear instructions or

comments for the children to effectively improve their work.

[C-T4-AR01-0002-1000]

> *Children continued to complete their pictures in this lesson. Teacher D walked around and checked each child's progress and product. She also gave her comments directly to the children and asked them to improve their pre-cuts.* <

[C-T4-AR01-0002-1300]

> *Teacher D gave lots of clear and definite instructions for children when she walked around to observe their progress.* <

Teacher D: You put a sun in your picture. But the sun should be drawn in this kind of way, use the yellow colour and the line should be…. you cannot draw this way… (Continued to teach the children how to draw the sun)

[C-T2-CL01-0002-0840]

Teacher C: Okay, now… let's open to page 43 and finish the third part together.

> *Teacher C started to explain the questions one by one and then announced the correct answer. She left some time for the children to finish it. During this period, she walked around and checked the children's answers in their textbooks.* <

[C-T3-IC01-0002-1350]

> *During the group work in this lesson, Teacher C walked around and checked the progress of each group's product.* <

Teacher C: (Talked to Group 2) In this area, you could add more description to introduce…

Teacher C: (Talked to Group 5) I think you could add some pictures there and it would become more lively and vivid.

Teacher C: (Talked to Group 10) You could change your headline in this paragraph… maybe you could use…

Teacher C: (Talked to Group 8) You did not put the table for your data, please add it to your work. And… here, you should stick this picture in more carefully.

Based on the literature review (Craft, 2005; Jeffrey and Wood, 2003) and the evidence found in this study, it is important for teachers and schools to provide an open and

safe learning environment and atmosphere for children because this can help them to enjoy school and increase their creative development, which is likely to lead to better learning results.

6.5 Other Pedagogies used in Taiwanese primary schools

Many related pedagogical practices were mentioned in the above sections based on my conceptual framework and this showed that these teachers' teaching methods had different influences on the children's PT, learning process or outcome. In addition, some evidence of pedagogies that were not included in the framework was found in the study and, since these pedagogies exist and are used in many Taiwanese primary schools, they deserved to be discussed here because they were found to affect the development of children's creativity. Although not every pedagogy can enhance children's PT or reduce their creative thinking, this evidence should still be analysed because it may be useful when considering how to improve the promotion of creative education in Taiwanese primary schools.

6.5.1 Correcting children's answers

The role of the teacher in education includes acting as a gatekeeper for children to build their knowledge and creativity. Csikszentmihalyi (2000) maintains that a creative product must be chosen and determined by the gatekeeper in the field. This means that teachers' responses, decisions or actions could affect the creativity of the children's product during courses in primary schools. Although teachers should provide an open climate and give children sufficient opportunities to develop their talents and express their ideas, the evidence in this study indicates that some teachers still prefer to give the correct answers and make a direct response when children's answers or words are inaccurate or inappropriate.

School A: Teacher A-1

Teacher A-1 paid much attention to conversing with the children during the lessons. She seemed to have a great deal of patience as she listened and provided the children with plenty of opportunities to speak. However, she immediately corrected any inappropriate utterances and helped other children to understand what they should notice in the lesson.

[A-T1-CH01-0014-1920]

>*Teacher A-1 talked about the politeness of visiting a neighbour.* <

Teacher A-1: OK, therefore, we could understand how we should behave in this kind of situation.

S_Jimmy: But we cannot visit him (the character in the lesson).

Teacher A-1: (Confused) Why do you want to visit him?

S_Jimmy: Because I want to chat with him.

Teacher A-1: Jimmy, why do you need to chat with him? The author? However, please go back to our content, your idea is not highly related to our issue.

Because teachers are also responsible for ensuring that the course content is covered within the allotted time, teacher A-1 also reminded children of the point in discussions or lessons. For example, in the case of school A, Jimmy was clearly a bright child who actively participated in class discussions, but he did not always obey the rules of the classroom. He sometimes spoke without raising his hand or expressed some ideas that were irrelevant to the topic in the lesson. However, teacher A-1 still gave him space to express his ideas, but she also corrected him if necessary.

[A-T1-CH01-0015-0348]

>*Teacher A-1 talked about the personality of grandma Wang in the textbook.* <

Teacher A-1: Very good. You mentioned grandma Wang is very kind and friendly and is always good to others in her daily life. This describes her behaviour, personality and….?

S_Jimmy: The appearance in her house.

Teacher A-1: (Seriously) Jimmy, we did not talk about her behaviours in the house. We are discussing her characteristics when she meets people. (Face to all children) Although I usually encourage you all to have more imagination, you still need to think whether your words relate to our discussion. It is also very important for you that you need to understand the right answer for answering my questions. OK?

In addition, Teacher A-1 was not only the teacher, but also the homeroom teacher in the class of school A. Therefore, building children's knowledge was not the only issue that concerned her. The children's good behaviour in daily life was also an important topic she emphasised during the lessons.

[A-T1-CH01-0015-0550]

>*Teacher A-1 asked children to imagine what grandma Wang looks like.* <

S_Jimmy: I think she looks like a countrywoman, um… like a foreigner..oh oh…also looks like…an old idiot.

Teacher A-1: (Seriously) An old idiot? (Facing all the children) Dear all, do you remember I told you yesterday that we cannot DO WHAT for people's appearance?

Students: Criticise.

Teacher A-1: Yes, we cannot criticise others because of their appearances. It is not correct and we might make the wrong understanding because we did not really know them. (Facing Jimmy) So, Jimmy, you mentioned the inappropriate words to describe people. Please pay more attention to it and do not do it again, OK?

Jimmy used inappropriate adjectives in this example and Teacher A-1 corrected him immediately and used this example to remind all the children in her class that people

should not criticise someone else's appearance. This is indeed an important issue in daily life and the teacher pointed it out in the class.

[A-T1-CH03-0023-1030]

>*While the children completed their work sheet for practising written words, teacher A-1 walked around the classroom to monitor every child's progress.* <

Teacher A-1: (Saw the scratches on the children's tables) Hey, sorry to interrupt you. (Seriously) Because I saw there are many scratches on some of the tables, I want to remind you all that we should treasure the communal items in school, and in our daily life. (Then, the teacher started to explain why this was so.)

Furthermore, the teacher needs to respond immediately when children behave badly or inappropriately at school. Therefore, teacher A-1 usually used examples based on life experience to teach children to develop good habits in their daily lives.

School B: Teacher B

When children produced an incorrect idea, teacher B sometimes told them the correct answer. This kind of teaching method enabled all the children to immediately understand what was correct and incorrect. The children could avoid making the same mistake again because they had learned the appropriate and correct way to solve the problem. This usually happened when children encountered new concepts and the teacher wanted to give them clear guidance to understand the teaching topic.

[B-T2-LN04-0039-0920]

> *Teacher B talked about the different colours of thinking hats.* <

S_Ray: Teacher, could we combine the white thinking hat and green thinking hat to make the laurel-green thinking hat?

Teacher B: No, you cannot. We could combine the different thinking hats, but not

this way. The colour is not a real colour. It is a symbol. We could use the white thinking hat and green thinking hat at the same time. But we will not say we use the laurel-green thinking hat. OK? I will explain more later.

Teacher B usually used many questions to help children to understand if their answers or ideas could be wrong. These questions were useful in helping children to develop their thinking skills so that they could successfully solve problems. Teacher B also cared about the children's feelings and hoped they would have the confidence and courage to present their ideas next time. He would not tell students their answer was wrong, but instead, try to understand their thinking and then give a clear explanation of the topic.

[B-T2-IRA02-0042-1020]

> *Teacher B asked the children to find the appropriate research methods for each of the research topics.* <

S_Ben: I think the best research method for topic No.5 is to analyse the documents. Because…. (He tried to explain his reason.)

Teacher B: Well…. Ben gave us an interesting idea for topic No.5. Because he thought ….. (teacher B gave a recapitulation of S_Ben's ideas) This is a very good idea to use in some topics which are related to the real history in our world. Topic No.5 is about the customer behaviour, so maybe the survey method would be more appropriate for the topic. But thanks Ben. To analyse the relevant documents is also very very important when we do the research.

School C: Teacher C, Teacher D and Teacher E

The teachers in School C also focused on providing children with the correct knowledge during their teaching in the class; therefore, if children gave an incorrect answer, the teacher corrected them immediately and asked them not to make the same mistake again. Based on the classroom observations in School C, Teachers C and D

did not usually give children another chance to explain their answers. They simply told them the right answer and what they should do during their teaching activities.

[C-T2-CL01-0002-1700]

> *Teacher C mentioned that there would be written work to do after the field trip next week. Therefore, the children need to learn how to write travel notes which they could use in their written work.* <

Teacher C: So, do you know why we will go to the National Taiwan Science Education Center for our field trip?

S_Andy: For the written work…

Teacher C: (Surprised) For the written work???

Other children: No No No!!!

Teacher C: Of course not for the written work! Where did you go for your field trips when you were first and second grade student?

Children: The zoo.

Teacher C: Yes, the zoo. So, why will the school take you to the National Taiwan Science Education Center in this field trip when you are in third grade? It must have a reason.

> *Children were quiet while thinking of reasons. Then Teacher C started to explain the reasons for choosing the National Taiwan Science Education Center as the field trip location.* <

[C-T2-CL03-0002-0001]

> *Teacher C asked children to practice the stroke order of new characters in this lesson.* <

Teacher C: Attention, I found someone did not follow the correct stroke order, please remember you should follow the stroke order to write the Chinese characters correctly.

Because the children in School C were 9–10 years old, not only was knowledge-building an important issue for these teachers, but also the children's behaviour in daily life. Therefore, these teachers corrected the children's inappropriate behaviour.

[C-T2-CL02-0002-0810]

> *Teacher C introduced the new Chinese characters in this lesson by explaining the meaning and the way to use them.* <

Teacher C: Look at this word "軍"(ㄐㄩㄣ,jūn). It means soldiers or serviceman. In the old days, only the boys could be soldiers. But now, women can also be soldiers. Just like nurses, we have some male nurses in the hospitals too.

Children: Ewww……

Teacher C: Attention, please. This kind of behaviour from you is very impolite and inappropriate. Now, there is gender equality in our society…(Started to explain gender equality. She spent more than 10 minutes on this.)

Some of these examples illustrate the need for teachers to immediately correct children's inappropriate behaviour in primary education. Since young children may not have learned to respect the rights of others and may sometimes be unaware that their behaviour is inappropriate, teachers have an important role to teach them how to behave and build good habits for life. On the other hand, another issue to point out is that some of the teachers failed to provide children with the time and space to express their ideas or practice their thinking. They used the traditional teaching method of telling them correct answer and instructing them to memorise it because it was important. This shows that some Taiwanese primary teachers still like to use this kind of pedagogy in their teaching, which will be further discussed in the next chapter.

6.5.2 Establishing rules in the classroom

The question of how teachers establish rules in the classroom will be discussed in this final section. Teachers need to maintain a level of control at all stages of education and reduce the disruption in the classroom to enhance the flow of their teaching and achieve their teaching objectives. According to the data collected from the three

different schools, the participants in this study were 9-12 years old and the teachers' pedagogy in the classroom was different based on the learners' ages. Therefore, the teachers usually needed to spend more time to establish rules and maintain order in the classroom to produce effective learning results, especially for young learners in primary school. In addition, the teachers were likely to ignore comments or questions from some children that may have had a negative impact on others' learning.

School A: Teacher A-1

Because the children in school A were 12 years old, teacher A-1 did not need to spend too much time on maintaining order in the class, but she still paid attention to the way the children should behave in daily life. She usually gave children an oral reminder when they behaved or spoke inappropriately.

> [A-T1-CH03-0023-1030]
> *>As children completed their work sheet on practising written words, teacher A-1 walked around the classroom to monitor every child's progress. <*
> Teacher A-1: (Saw the scratches on the children's tables) Hey, sorry to interrupt you all. (Seriously) Because I saw there are many scratches on someone's table, I want to remind you all that we should treasure the communal items in school, or in our daily life. (Then, the teacher started to explain why this was so.)

Moreover, the data showed that teacher A-1 might interrupt children who failed to respect another's turn to speak. She would not respond to students who did not speak at the correct time because she hoped to teach them good speaking habits.

[A-T1-CH02-0021-1650]

>When Tracy answered Teacher A-1's question. <

S_Jimmy: (Did not raise his hand) (responded to Tracy's comments). I know, you mean that the ants would move like this. (Jimmy moved his body) and….

Teacher A-1: (Interrupted Jimmy's speaking) Jimmy, please wait. Now is Tracy's turn. We let Tracy finish her turn, OK?

[A-T1-CH02-0021-1800]

>Teacher A-1 continued to discuss with all children about the issue presented in this lesson. <

S_Jimmy: (Raised his hand and wanted to speak)

Teacher A-1: (Ignored Jimmy's request) (Saw Ben raise his hand) Ben, what do you think? (Jimmy still raised his hand, but teacher did not respond to him)

Furthermore, some children may have wanted to express ideas that were unrelated to the issues in the lesson. In this case, teacher A-1 sometimes prevented them from asking questions that were not important or would take a long time to discussin order to keep the class on track to achieve its objectives.

[A-T1-CH02-0021-0820]

>Teacher A-1 used the life experience to motivate children's interest. <

Teacher A-1: Are there any questions about it? (Teacher wanted to end this topic)

S_Johnny: (Raised his hand and wanted to speak)

Teacher A-1: Is it very important? If not, please come to see me after the class, OK? (Back to the lesson's content)

School B: Teacher B

The children in the talented class that was observed in school B usually liked to express their ideas. Therefore, there were many interactions between teacher and children, or children in pairs or groups. Because he hoped that everyone could have the same opportunity to speak in the class, Teacher B usually stood back and provided

every child who wanted to speak with an opportunity to do so. However, some of the children who had a strong personality held rigid views, which could easily lead to arguments. Therefore, teacher B needed to pay attention to these children's behaviour, such as their manner of speaking, to prevent unfriendly or offensive arguments in the class. He interrupted those who failed to respect others' right to speak and adopted a serious attitude toward this issue, using strong words to correct children's impolite behaviour.

[B-T2-LN04-0040-0630]

>*Teacher discussed the issue of "non-corporal punishment at school". Many children raised their hands to express their ideas.* <

>*When S_Anna expressed her idea, S_Ben interrupted her and started to talk about his idea because he did not agree with Anna's viewpoint.* <

Teacher B: Ben… Sorry I need to interrupt you. You SHOULD respect the spokesperson. You also don't like someone interrupting your conversation, right? Please let Anna to finish.

[B-T2-LN03-0037-0630]

>*Teacher B discussed the "Green Thinking Hat" and gave examples for how to use it. After the explanation, teacher B posed a question and asked children to use the green thinking hat to solve this problem.*<

Teacher B: Now… could you tell me how you use the green thinking hat to solve this problem?

>*S_Johnny and S_Pan expressed their ideas about this issue. But their viewpoints were very different. Therefore, the two children had the argument.* <

Teacher B: Johnny and Pan, please keep calm, ok? Everyone could have different points of view. Firstly, we should listen carefully to what they said. Even if you do not agree with that, you still need to respect others' ideas.

[B-T2-IRB01-0009-0030]

>*At the beginning of the lesson, teacher B emphasised the rules in the classroom, such as everyone should respect and listen to each other.* <

In addition, teacher B showed concern for children's learning situation. If children were not concentrating in the class, teacher B reminded them immediately and he also tried to understand why they were distracted by talking to them in private. Teacher B listened patiently and encouraged children if they were finding certain issues difficult.

[B-T2-IRB03-0044-0930]

>*Teacher B found S_Jimmy usually distracted and playing with his pen. He gave a warning to Jimmy and asked him to concentrate more in the class.* <

>*Because teacher B was very worried about S_Jimmy's learning situation. He asked Jimmy to talk with him in private after the class and asked Jimmy if he had any problems or difficulties.* <

>*Teacher B also told the researcher that he was very worried about Jimmy's situation because Jimmy was not keeping up with the schedule in the courses. Teacher B also said he would continue to observe and show more concerns for Jimmy and tried to help him to catch up on his progress.* <

School C: Teacher C, Teacher D and Teacher E

Because the children in School C were younger than those in the other two schools, the data showed that Teachers C, D and E sometimes spent much of their time maintaining order in the classroom. Moreover, these teachers were also used to providing clear and accurate instructions or reminding the children of the rules during the lessons and asking them to follow these rules to prevent disorder in the classroom. Therefore, if some children displayed inappropriate behaviour or spoke during the lessons, the teachers stopped and corrected their behaviour immediately and made a clear, but serious announcement, "You SHOULD or SHOULD NOT do…." to all students.

[C-T3-SO01-0002-0320]

> *Teacher C mentioned that another teacher reported to her about some children in this class not obeying the rules in the library.* <

Teacher C: Attention! I got a report that some of you were not quiet when you were in the library. Let me remind you of the rules in the library: you should be quiet and walk slowly when you use the library. If you cannot obey the rules, I will prohibit you from using the library anymore.

[C-T3-SO01-0002-0001]

> *Teacher C wrote the homework on the blackboard and asked children to copy it in their contact book. She also warned the children about obeying the rules in the lesson.* <

> *Teacher C checked the issue of cleaning in the class. She added points for the child who did a good job of cleaning.* <

> *Teacher C started to divide the children into groups for the field trip next week. Some students made noise and were chatting when Teacher C was busy.* <

Teacher C: Attention! I am very serious in this request. Please comply with the rules. You should be quiet when I put you in order, not only in the class but also when you are on the field trip next week!!!

[C-T4-AR01-0002-0940]

> *Teacher D took one child's picture.* <

Children: (The voice) Booo……

Teacher D: Attention! You cannot use this kind of behaviour to comment on another's work. Everyone has good points but also bad points. We should respect everyone's work.

In addition, because Teacher C was also the tutor of children in School C, she always paid much attention to establishing the rules and correcting the children's behaviour in the classroom.

[C-T3-CL01-0002-0001]

> *In the beginning of the lesson, Teacher C reminded the children that they should pay attention to their behaviour and obey the rules during class, such as being quiet and focused or picking up the trash near their seats at all times.*<

> *After the announcement of the rules in the classroom, Teacher C started to teach*

the topics of the lesson. <

Teacher C: Sam!!! Why are you not focused on the lesson and doing the drawing in your textbook? This is the behaviour that is expected in class. Please do not do it again.

[C-T3-CL02-0002-1540]

> *During the teaching activity, Teacher C found that some children were not focusing.* <

Teacher C: Attention!!! Now put your hands behind your back. I found that someone was not focusing on my teaching…(Started to give a clear announcement about the rules in the classroom.)

[C-T3-CL03-0002-0259]

Teacher C: Andy, why is your sitting position too low to study? Please sit upright! (Looked at all the other children and observed their sitting positions.)

> *Then, Teacher C continued to teach the stroke order in this lesson. She found one child did not focus.* <

Teacher C: Tim, you are not focused. Please stand up and do the stroke order of this character in front of all the students.

[C-T3-IC01-0002-1150]

Teacher C: Attention!!! Now put your hands on your head. (After the children complied) I would like to remind you that you only have 20 minutes left, please do progress with your work as much as you can.

> *Children continued to complete the posters in their groups.* <

Teacher C: Attention!!! I found that the floor under your seats is not clean; please remember to clean it before the end of the lesson.

[C-T3-IC02-0002-0200]

> *Children continued to complete the posters in their groups.* <

Teacher C: Attention!!! Now you only have 5 minutes left. And please be quiet when you do your work. It is very noisy in the class now and you should not leave your seats. Please do not chat and stay focused on your group work.

Furthermore, the teachers in School C sometimes also used an award system to maintain order and this effectively encouraged the children to complete their tasks.

For example, a teacher usually gave a kind of prize when children performed group tasks. Some children in the group would push others to finish the work because they hoped to win a prize or obtain extra points.

[C-T5-SC01-0002-0600]

Teacher E: If your performance is good in today's lesson, I will let you do the extra experiment which is about the "Smoking" task. But the smoking does not involve real smoke.

Children: Ya!!!!!!

[C-T3-CL01-0002-1700]

Teacher E: Attention! Now we will start to clean the table. I will add points to the group who is the first to complete the table cleaning. Okay…now, start!

> *The children in the groups started to clean their table and they were very focused on and tried to be the first group to gain the points.*<

There is another point to stress apart from the above evidence which is that, while some pedagogical practices may not have a positive impact on certain aspects of children's learning, they do not always have a negative impact either. For instance, although the children's creativity and imagination may not have been enhanced during these courses, they still learned the knowledge and built good habits for life, as happens in many Taiwanese primary schools. This could be grounds for a discussion about improving teachers' creative pedagogical practices in later chapters, but it could also help us to consider why teachers do not choose a creative pedagogy and the kind of problems they may encounter during their teaching in order to suggest the further implementation of the creative education policy in Taiwan.

6.6 Conclusion

The aim of this chapter has been to understand the pedagogy used by the teachers in the three primary schools under study. The way in which the teachers' teaching methods affect the children's PT and their learning during the lessons has become more visible with the evidence in this chapter. It was found that some teachers used a creative pedagogy by standing back to provide the children with time and space to complete their tasks, which enhanced their PT. Another factor that was found to strengthen children's PT in this study was the provision of a supportive environment for children's learning. If teachers can build this kind of learning climate or environment, it will give children more opportunity to develop their ideas and practice their thinking skills.

Additionally, two pedagogies that were not included in the conceptual framework were analysed in the last part of this chapter. These pedagogical practices could lead to some aspects being further reflected in primary education because they may be the result of challenges teachers meet when using a creative pedagogy in their teaching. The relationship between the challenges and other external factors that affect teachers' pedagogy will be further discussed in the next chapter.

Chapter VII
Discussion

7.1 Introduction

The purpose of this chapter is to discuss the findings of the empirical analysis of the relationship between children's PT and teachers' pedagogy, each feature of which was analysed in the previous chapters based on the conceptual framework of the study as described in chapter III (see Figure 3.11, page 108). This study focused on three elements, namely, Children's PT, Teachers' Pedagogy and the Environment (in an enabling context). In addition, the external factors which may affect children's PT and teacher pedagogy are also discussed in this chapter.

The previous chapters (Chapter V and VI) contained an analysis of the data related to children's PT and teachers' pedagogy collected from three different primary schools in Taiwan. The evidence also included many perspectives and clues about why the children exhibited this kind of PT during the courses or why the teachers adopted a certain pedagogy. Therefore, the conceptual framework will be used in this chapter to discuss the interaction between the children's PT, the teachers' pedagogy, the learning environment and other external elements that are relevant to the research questions. This chapter is divided into three sections, the first of which contains a discussion of the evidence of the children's PT behaviour found during the observations of classroom activities with an emphasis on the different levels of PT features in each case. The second section contains a discussion of the influence of teachers' pedagogical practice on children's learning and PT in Taiwanese primary schools. As mentioned in chapter III, there are the different social and cultural contexts between

Eastern and Western countries, such as Taiwan and the UK. Some external elements, such as policy implementation, curriculum structure, teachers' professional development and the background of schools and classes, which can affect teachers' pedagogical practice are considered in the third section. This is based on the evidence of the three cases, which led to the formation of the conceptual framework of the relationship between children's PT and teachers' pedagogy in Taiwanese primary education illustrated in Chapter III.

The data which was analysed for the external elements was also from the classroom observation. According to the different children's PT behaviour and teacher's pedagogical practice, the researcher organized these information and investigated the impact of the external elements in Taiwan's primary education. The multiple-case study approach provides this study a variety of viewpoints to observe the children's PT and teacher's pedagogy in the different sociocultural environment. However, there might be other elements which could affect children's PT and teacher's pedagogy in primary education. This study was focused on the class background, children's age, curriculum structure (subject difference) and the related professional training experience for teachers, which could find the relevant evidence during the classroom observation.

7.2 Children's Possibility Thinking in Taiwanese Primary Schools

According to the PT model of children at stage 3 (9-11 year-olds) in UK primary schools (Craft, Cremin, Burnard, Dragovic, and Chappell, 2012), PT consists of 11 evidence-based features, namely, question-posing (Q-P), question-responding (Q-S), immersion, being imaginative, play, innovation, risk-taking, self-determination, development, intentional action and peer collaboration. Using this children's PT

model, the analysis in my study was based on evidence of the average frequency of each PT feature identified per class in the three Taiwanese primary schools, divided into three levels of Low (Frequency<1), Medium (Frequency 1-3) and High (Frequency>3). The discussion in this section is based on answering research question 2: **'How do children in Taiwan's primary schools use PT during the learning process?'**

The overall level of the children's PT performance and of each PT feature is shown in Table 7.1, from which it is evident that the PT of the children in each school was different. The results contained evidence of the children's performance and the teachers' behaviour during the different courses or at different schools. There are three different levels in Table 7.1 to represent the different frequencies of each item. The 'low' level signifies that the children rarely practiced their PT during the courses; they were more likely to sit quietly and follow the teacher's instruction. However, the average frequency was also affected by the subject difference because the frequency may have been very different in different subjects. For example, in this study, the children in School C exhibited five times more self-determination in the Science course than the Chinese course. Furthermore, some results showed that it was at a 'low' level, but the average frequency was very close to the 'middle' level. On the other hand, the results showed a very low level of some PT features, such as 'Play' and 'Innovation' in School C, which could indicate that the children were not given the opportunity to be imaginative or playful during the lessons. There was also still a difference in the 'low' level, as seen from the evidence provided in Chapters V and VI.

There was some evidence that the children in the 'middle' level may have been more

activated and involved in the teaching activities, since they had more conversations with teachers and classmates. As for those in the 'high' level, they exhibited a great deal of behaviour related to PT, such as posing questions, responding to questions and self-determination. There was more interaction between the teachers and children and the children were also given more opportunities to speak during the lessons. The results indicated that there were many 'high' levels of PT features in school B, which had joined the FI policy, and the teachers had been trained and had experience of enhancing children's creativity. The collected data showed that the children were given much time and space to express their ideas during the class and the teacher also provided an open climate and environment in order to develop the children's creativity. Although the class in School B was a talented class, which was different from the primary classes in Schools A and C, it could still present another kind of Taiwanese primary education and facilitate an understanding of how the children achieved a high level of PT performance in the learning activities.

The results provided in-depth information to understand how the children practised their PT and the kind of environment that affected their learning performance. In addition, the different evidence of the children's PT and the teachers' pedagogy in the previous data analysis chapters also indicated that subjects, children's ages, class sizes and external elements needed to be addressed to observe the relationship of PT and TP and this will be discussed in later sections. Moreover, it was also indicated that the implementation of the FI policy may have enhanced the children's PT behaviour because the PT levels in the two schools that had joined the policy were found to be 'middle' and 'high'. However, teachers' pedagogy is another important factor that affects the development of children's creativity and this will be discussed in the later sections of this chapter.

Table 7.1 Children's PT performance in three primary schools in Taiwan

		Case I- School A (Primary class)	Case II- School B (Talented class)	Case III- School C (Primary class)
	'Future Imagination' Policy Implementation	**YES**	**YES**	**NO**
	Children's Overall PT performance	**Middle**	**High**	**Low**
Process	Question-Posing	L	L	L
	Question-Responding	H	H	L
	Immersion	L	H	M
Process-Outcome	Play	L	L	L
	Being Imaginative	M	M	L
	Innovation	L	L	L
	Risk Taking	L	M	X Absent
Outcome	Self-determination	M	H	L
	Development	L	H	L
	Intentional action	L	H	L
	Peer collaboration	L	M	L

7.2.1 Possibility Thinking of children in School A

The evidence in this study indicates that the children in School A had many opportunities to express their ideas and pose questions if they were confused during their learning. Due to the importance of Q-P and Q-R in the theory of PT, this could enhance the possibility of other features of PT, such as increasing their motivation and

interest, giving them more chances to develop their imaginative or creative ideas, or helping them to find more ways to solve the problems they encounter during their learning activities. The evidence also showed that the teacher in School A provided the children with an open and friendly learning environment and climate. She not only gave the children more chances to speak, but the design of the learning activities and how she led the lessons also affected the children's learning process. The teacher in School A not only used many open-ended questions, but also tried to utilise many different teaching methods or additional materials to stimulate the children's interest in learning.

Moreover, the feature of 'risk-taking' existed in School A. Although there was little evidence of the children trying to take a risk to express some ideas that may have been socially unacceptable or incorrect, the teacher did not interrupt them when they did. This indicates that the teacher was open-minded about the children's creative or imaginative learning behaviour during the teaching, which may be further evidence of the importance of a supportive learning environment for the development of children's PT.

On the other hand, the results in all three cases indicated that the features of PT are related to each other. Although there was a small difference in the level of each feature, it was still evident that the features were closely connected and affected by both learners and teachers in an enabling context (Burnard et al., 2006).

7.2.2 Possibility Thinking of children in School B

The class in School B is the talented class, which is a special case in this study because the talented class is not a primary class. The children in this class are chosen

by the school from their original primary class and the teaching courses are also designed independently by the teacher in the talented class. The observation of this class could illustrate how these talented children used their PT during their learning activities, as well as whether the pedagogy the teachers used to enhance the children's creative development or if they exhibited different levels of PT from their peers in the primary class.

The findings from School B indicated that the children in the talented class had a high level of PT behaviour. They also possessed a very high level of self-determination during the learning activities and this stimulated them to ask many questions and become immersed in the learning activities with their classmates. There was much evidence that the children used their PT to solve problems or complete tasks assigned by the teacher (details of the evidence of each PT feature in School B can be found in Chapter V). In addition, the teaching topics were different from those in the primary class, such as debate and individual research, which increased the children's motivation to learn more during the courses. Since the teacher in the talented class had the relevant training for creative education and teaching experience, the atmosphere and environment in the classroom were very open and friendly and he used a huge amount of creative pedagogy to lead the children to develop their critical thinking. Many open questions were used in this class and the teacher usually provided students with the space and time to express their ideas and find the answers. The results in this case proved that the teacher's pedagogy has a very obvious influence on children's creative development. In this kind of learning environment, the children became immersed in the learning activities and tried as much as possible to develop their thoughts in order to complete the tasks, which led to the generation of some extremely creative or imaginative ideas.

The level of ‘risk-taking’ in School B was ‘middle’, which was higher than the level in School A. The children in the talented class produced some novel ideas during the lessons, but these may not be sufficiently effective to solve problems in the real world. However, they tried to express these kinds of ideas, even though they did not know whether they were correct or not. This illustrates that the teacher indeed provided the children with a comfortable and safe learning environment in which they felt much more confident and were not afraid to make mistakes. Some external elements were found in this study, which may be important for children’s PT and teachers’ pedagogical practice in Taiwan’s primary education, and these will be discussed in later sections.

The level of the PT feature of ‘peer collaboration’ was ‘middle’ in this case, which was higher than in the other two cases in this study. Some of the special courses applied in the talented class, such as ‘debate’ and ’individual research’, meant that the learning activities were completed in small groups, and although the children collaborated with each other, they also argued during their discussion. This interaction between the children, when they could communicate and express their ideas as well as consider others’ opinions, helped to develop their critical thinking ability.

7.2.3 Possibility Thinking of children in School C

In contrast to Schools A and B, the children’s PT level in School C was ‘low’. This means that there was less evidence that they used their PT during the learning activities, which may have been due to many reasons. Firstly, the levels of Q-P and Q-S in this class were both ‘low’, and since Q-P and Q-S are both important elements in the PT process stage, they may influence the enhancement or reduction of other

features in children's PT behaviour. For example, the results showed that the children in School C usually just sat in their seats in the class, listened to the teacher and followed the teacher's instructions. They may have been immersed in learning new knowledge, but they showed no playful emotion. Also, it was hard to find evidence of their creative performance since they had few opportunities to express their ideas during the lessons. However, the findings indicated that the average frequency of self-determination and intentional action was low, but near the middle level, which also showed that the children wanted to be engaged in some of the learning activities that interested them.

The findings from School C also showed that not only the children's learning behaviour, but also the teachers' pedagogy, are common in Taiwanese primary education, especially in the 1st-4th grades when the children are young. The influence of the teachers' teaching methods at this stage was observed to be very different from that of the teachers who taught the older children because their aim was to teach the children how to memorise and master the core curriculum. According to Beghetto (2015), Hatano (1993) also perceived that it is easy for teachers to teach students to acquire and reproduce "ready-made" knowledge.

However, it was also found that the children in School C usually just sat and listened and followed the teacher's instructions. The level of question-responding (Q-S) behaviour was greater than that of question-posing (Q-P) in this case; therefore, the children were still motivated to find the answers to the teacher's questions. The findings also showed that, even though they were younger than the children in the other two classes, they were still observed to collaborate with their peers. It was good to find that they tried to use questions or give comments to communicate their ideas to

their classmates during the lessons. This evidence proved that the younger children still practiced PT behaviour during their learning, although at a very different frequency from older primary school children.

In short, based on the analysis in this study and the conceptual framework and theories developed by previous researchers, teachers play an extremely important role in the development of children's creativity and learning in the educational field. Therefore, the findings related to the teachers' pedagogy in these three cases will be discussed in the next section in order to determine their different influences on Taiwan's primary education.

7.3 Findings related to teachers' pedagogy in Taiwanese Primary Schools

The evidence in Chapter VI showed that teachers used different pedagogical practices for different learning activities. Based on the conceptual framework, the study was focused on how the teaching methods teachers used and the kind of learning environment they built in the classes affected the children's PT or learning, as analysed in the previous chapter. However, the findings showed that the teachers' pedagogy could be very different based on different subjects, their background and experience, the children's ages, or the pressure from the scheduled examinations in schools. Also, the teachers did not only use one pedagogy in the lesson. They sometimes combined different pedagogical practices and used them when they thought it would help the children to learn. Therefore, many reasons could affect the teachers' pedagogy. When analysing the features of each of the teachers observed in this study, it was found that other elements existed that affected the children's learning in Taiwanese primary education and these will be discussed in a later section of this chapter.

The third research question: **'What is the nature of teachers' pedagogical practices in Taiwan's primary schools?'** was answered in Chapter VI, as well as below.

7.3.1 Teachers in School A (primary class, joined FI)

Two teachers from class A participated in this study. According to the classroom observation, these two teachers were highly passionate about their teaching and interested in finding ways to enhance the children's creativity and imagination. Therefore, the findings showed that the teachers used many different teaching materials, such as an electric whiteboard or an I-pad, connected the teaching topics to recent news, and used videos or photos to increase the children's motivation to learn. This showed that the teachers in this case not only used the traditional didactic instruction teaching method, but also tried to prepare many different additional materials to make their teaching more interesting and stimulate the children's interest in learning. Based on their pedagogical practices, these two teachers usually provided the children with a great many opportunities to express their ideas and did not immediately interrupt them if their answer was incorrect. Many leading questions from the teachers were found to enhance the PT of the children in School A.

Another important finding from the analysis of the observation data and the short interviews with the teachers in School A is that these two teachers collaborated during their teaching. Although they taught different subjects, they communicated with each other a great deal during their rest periods and also provided support for each other during the lessons. They also tried to use similar teaching topics in different subjects to give the children a variety of viewpoints during the learning activities. In addition, since this school had joined the FI policy, these two teachers usually collaborated in

the design of some learning activities to enhance the children's creativity and imagination during their teaching. This was evidence that the implementation of the FI policy had influenced the teachers' pedagogy in this case, which will be discussed in detail later in this chapter.

7.3.2 Teacher in School B (talented class, joined FI)

Only one teacher was observed in the talented class of School B. The courses of 'debate' and 'individual research' were observed to understand the children's PT practice during their learning. The teacher in this class had been trained and had a great deal of experience in enhancing children's creativity. He also expressed a keen interest in creativity and considered it to be very important for children's education. Therefore, this teacher had received the relevant training to develop children's creativity and imagination and had also helped his students to win an international competition about creative research many times. Thus, the reason for choosing this teacher as one of the cases in this study was to find more in-depth information to determine if his teaching pedagogy could better enhance children's PT than that of the teachers in the other two primary classes.

Since the curriculum of the talented class was structured very differently from that of the primary class, the teacher in the talented class had more space and power to modify the content of the courses and could design an individual schedule for the children's working progress. It also meant that he could change his pedagogical practice at any time, depending on the status of the children's learning. In addition, there were fewer children in the talented class than the primary class, which meant that the teacher could give all the children equal opportunities to express their ideas orally during the teaching, and he usually created a friendly and open learning

environment and was patient in listening to the children's words.

Moreover, the teacher also used many leading questions rather than providing direct answers. He aimed to lead the children to find the answer themselves or train them to express their ideas more clearly during conversations. He liked to use 'why' and 'how' questions to allow the children to reconsider their ideas to see if they could find a better answer or talk about any problems they might have. Based on the evidence found in this study, the teacher in school B used a great deal of creative pedagogy during his teaching, but he also created an open-minded learning environment in his classroom for the children to develop their thinking and ideas. This could be a good example of the way teachers' pedagogy enhances children's PT during their learning activities.

7.3.3 Teachers in School C (primary class, NOT joined FI)

Three teachers from School C participated in the classroom observation. According to the data analysis in the previous chapter, each teacher had a different teaching pedagogy. Teacher C in School C was also a tutor for this class. Therefore, the evidence showed that she had to spend a great deal of time maintaining order because she wanted the children to follow her instructions during the teaching. Another reason for teacher C's use of the traditional didactic instruction teaching method during the lessons may be the children's age. This will be discussed in later sections.

Teacher D was also a very typical and traditional example of senior teachers who have many years of teaching experience in Taiwan. In her lessons, she usually told the children how to complete the tasks 'CORRECTLY' and the 'correct answer' may have been the one commonly perceived by most people; for example, during the

drawing, she told the children how to draw the sun in a specific way, as a circle with a specific yellow colour. Although her pedagogy cannot be considered to be wrong, it also cannot be considered to help to develop children's creativity during their learning activities because it gives them limited space to express their ideas. They are only taught to use the 'correct' method the teacher tells them in class. They are used to sitting quietly in the class and listening and following the teacher's instruction. Li and Johnston (2016) indicate that this is common in Chinese classrooms and that 'the students in this system of education are generally described as merely quiet learners, reluctant to participate in classroom activities and to ask questions'. (p.168)

However, it was observed that some of the teachers tried to teach more creatively. For example, teacher E taught the science course in School C and did not only use didactic instruction in his class, and the children were much more playful and interested in the activities in this course. This teacher also liked to pose questions to lead the children to find the answers instead of telling them the correct answer directly. This could illustrate the different effect of teachers' pedagogy in primary schools, but it also proves that some teachers are changing the traditional teaching methods and trying to provide children with more possibilities to develop their thinking during the learning, even though the school has not implemented the FI policy. The fact that some teachers' pedagogy has begun to differ from the traditional one could be considered to be good progress for creative education in Taiwan.

However, although there was much evidence that the teachers in School C used a great many non-traditional teaching methods during their teaching, didactic instruction was still beneficial for some lessons, especially when the children needed to learn important knowledge in a short time or needed to pass the examination in the

education system. In addition, the case of School C showed that most primary teachers in Taiwan use this kind of pedagogical practice during their teaching. This does not mean that it is not a good pedagogy for primary education in Taiwan, but it may not help to enhance children's PT or imagination when the focus is on creative education.

In summary, the findings of different children's PT and the teachers' pedagogy from these three schools illustrate that there is a close relationship between these two factors and many elements can affect them during the teaching and learning activities. The findings also suggest that the learning environment is the key element that can increase children's PT and a friendly, playful, and open-minded learning place and climate can provide the best support for children's learning. However, the learning environment should be very different for different courses. For example, the learning climate should be much more serious if the subject involves a regular examination in primary education.

Therefore, these kinds of external factors that affect teachers, learners and the environment are also considered in the conceptual framework of this study and will be further discussed in later sections.

7.4 Relationship between children's possibility thinking and teachers' pedagogy in Taiwanese Primary Schools

Each of the three different cases in this study has its own features that could be used to more deeply understand the current status of children's PT and teachers' pedagogy in different kind of schools or classes. Based on the data analysis, the children's PT

and teachers' pedagogy in Taiwan's primary schools are influenced by the same three factors as those that were assumed to affect education in Chapter III, namely, children's age and class size, different subjects, and teachers' training background (which also relates to policy implementation)(See figure 3.11, Page 108). The influence of these factors will be emphasised in the following paragraphs for a better understanding and the relationship between them, children's PT and teachers' pedagogy will be discussed in depth. The answers to research questions 4 and 5 below will also be provided in this section.

4. **What is the relationship between children's PT and teachers' pedagogy in Tawian's primary education system?**
5. **What factors and processes have contributed to changing teachers' creative pedagogy and children's PT in Taiwan?**

7.4.1. Children's Age and Class Size

(1) Children's Age

Table 7.2 Children's age and their PT performance in three schools

	Case I- School A (Primary class)	Case II- School B (Talented class)	Case III- School C (Primary class)
Children's Age	6th Grade (11-12 years old)	5th Grade (10-11 years old)	3rd Grade (8-9 years old)
Children's PT performance	**Middle**	**High**	**Low**
The related stage of the previous PT study	Stage 3	Stage 3	Stage 2

When comparing these three cases, the age of the children in School C is the lowest in the study. Teachers in School C usually need to spend a great deal of time paying attention to the children's daily living habits or teaching them to obey the rules in the classroom. For example, since teacher C is the tutor of the class in School C, she always needs to be very focused on the children's behaviour. If they did not respect each other's words or failed to focus on her teaching, she stopped teaching and asked all the children to pay attention to this kind of inappropriate behaviour and reminded them not to repeat it. The fact that the teacher in School C paid much attention to the issue of children's manners and routines in order to establish good rules in the classroom may have delayed the progress of the teaching schedule.

Moreover, because they were only 8-9 years old and this was the third year of their primary education, the children had little experience of life or learning. Therefore, the aim of the teaching at this stage was focused on how to build up their background knowledge and skills in each subject, such as their levels of literacy and numeracy. Hence, the data showed that the teachers in School C, especially the teachers of the Chinese language and Mathematic courses usually used traditional teaching methods, such as didactic instruction, in order to enhance the children's understanding of the topics more quickly and achieve effective learning results during the lessons.

In addition, the children may not react very quickly and pose questions or find problems during the lessons due to insufficient background knowledge; therefore, the teachers in School C directly provided them with the correct answer or information and asked them to repeat or recite this in class to avoid a failure of learning. In this case, the young children in the class may not have had many opportunities to practice

their individual thinking skills. On the other hand, since the children in School A were older than those in the other two schools, the teachers also provided them with more opportunities to speak and express their ideas because they may have some background knowledge or experience of learning.

There is less evidence of children's PT in School C than in the other two cases and the "Risk-Taking" of PT is absent, as confirmed by previous PT researchers (Craft et al., 2012). The reason for this absence in this case may also be related to the children's age. Because teachers usually want to provide as much support as they can, they seldom allow the children to do whatever they want to do or express their thoughts in order to build the correct realisation of knowledge. The children were told the correct ways to solve a problem, but they did not have an opportunity to understand why the problem occurred.

(2) Class Sizes

Table 7.3 Class sizes and children's PT performance in three schools

	Case I- School A (Primary class)	Case II- School B (Talented class)	Case III- School C (Primary class)
Class Size	18 children	15 children	29 children
Children's PT performance	**Middle**	**High**	**Low**

The number of children in the class is also an issue that may influence teachers' pedagogy, as well as the performance of children's PT during the teaching and learning activities. Since there is usually only one teacher for one course in Taiwan's

primary schools, that teacher needs to maintain order in the class and ensure the progression of the children's scheduled learning. This is a huge challenge for teachers who need to teach and simultaneously control the children's progress and behaviour. Based on the data in this research, the teachers sometimes interrupted the teaching activities because they needed to correct the children's behaviour or answers immediately. This is because they hoped that by doing so, the children would not make the same mistake or engage in the same kind of inappropriate behaviour again. If they can prevent these situations from occurring, the teaching they provide will be more fluent and the children's learning would proceed more efficiently during the lessons.

The evidence of the classroom observation in these three schools indicated that teachers used many traditional teaching methods (didactic instruction) and failed to provide children with many chances to speak if the number of children in the class was high. This meant that teachers tended to use more didactic instruction during their teaching in order to control the time of the teaching schedule and make good learning progress, especially when they taught the specific subjects that were periodically examined in the school. This was because some of teachers believed that this teaching method was the fastest way for the children to absorb new knowledge in a short time and they could more easily maintain order in the classroom if they used didactic instruction. For example, there were 29 children in the class of School C, which is closely to the average number in Taiwan's primary schools (the average of number of children in Taiwan's primary schools in 2011-2012 is 24.35, which is retrieved from the department of statistics in Taiwan's MOE https://stats.moe.gov.tw/qframe.aspx?qno=NwAzAA2). The tutor of the class in School C usually used didactic instruction when she taught the Chinese Language and

Mathematics. She preferred to tell the children the correct answers and the correct way to solve the problems. She used this kind of teaching pedagogy to prevent the children from failing and she did not give them many opportunities to speak during the lessons.

On the other hand, if the number of children is low, the time in the lesson will be more flexible and the teacher might provide space for all the children to express their ideas. For example, there were only 18 children in the class of School A, which is fewer than the average in Taiwan's primary schools. In this case, the teacher provided most of the children who wanted to express their ideas or answer questions with more chances to speak during the teaching activities. The teacher in this class also encouraged children to speak out as much as possible. Therefore, there was some evidence of the teacher asking specific children who are not comfortable about expressing their ideas in the lesson to answer questions. Moreover, the teacher in School A also liked to pose many questions during the lessons to encourage the children to vary their ideas as much as they could. When the children had more time and space to develop their ideas or even pose questions about confusing points, they could practice their individual thinking skills during the learning activities.

Furthermore, as shown in the Table 7.1, the children's PT in School B was high. This was not only due to the small number of children, but also the different type of class (talented class) and the children's personality. The teacher in School B had more space and power to design the teaching activities in the talented class. In addition, because of the fewer children compared to the primary class, he could also provide more speaking opportunities for them during the lessons. In terms of the children's personality, those in the talented class were more confident than those in the primary

class and more eager to express their ideas spontaneously. They were usually the top three in their original class and their learning ability was also better than that of other children based on the qualifying examination for entering the talented class. Therefore, the teacher in School B could design different kinds of activities that included a variety of topics or social issues because he could control the time and the learning schedule. The smaller class size also enabled the teacher to give all the children a chance to speak and practice their individual thinking skills.

7.4.2. Different Subjects

Table 7.4The children's PT performance in different subjects

	Subject	Case	Children's PT performance
Exam Pressure	Chinese Language	Case I- School A (Primary class)	**M**
		Case III- School C (Primary class)	**L**
	Mathematics	Case I- School A (Primary class)	**M**
	Science	Case I- School A (Primary class)	**M-H**
		Case III- School C (Primary class)	**M-H**
	Society	Case I- School A (Primary class)	**M**
		Case III- School C	**L**

		(Primary class)	
Non-Exam Pressure	Computer Science	Case I- School A (Primary class)	**H**
	Art	Case III- School C (Primary class)	**L-M**
	Integrated Curriculum	Case I- School A (Primary class)	**H**
Special Course	Talented class	Case II- School B (Talented class)	**H**
	Extra Activities	Case I- School A (Primary class)	**H**
		Case III- School C (Primary class)	**M**

There are seven different kinds of learning fields in Taiwan's primary education, namely, Language (Chinese Language and English), Mathematics, Science and Computer Science, Society, Arts, Health and Physical Training and an Integrated Curriculum. There are formal examinations in some subjects, such as the Chinese Language, English, Mathematics and Science, during each term based on the learning goals to ensure that the children's learning is progressing. Moreover, the names of the top three children in each class are announced after each examination and the parents are also anxious to know the results of these examinations. Therefore, teachers who teach these subjects not only need to design a teaching schedule, but also need to make time to provide practice worksheets or small tests for the children before the formal examinations. This may also put pressure on teachers and influence their

teaching pedagogy.

Besides, children's PT in these different types of subjects may be different. They may be more intense and try to remember the important points the teacher told them in the courses because they understand they will have formal tests during the term. They are quieter in these courses and they usually just sit and listen to the teacher. On the contrary, they are more relaxed and comfortable in the courses that have no formal exams attached to them. In addition, the teachers can also initiate more interesting discussions or activities in these courses, which may increase the children's interest in learning so that they will express their ideas more spontaneously. The three types of subjects observed in this study will be discussed in the following sections, namely, subjects accompanied by exam pressure, subjects without exam pressure and Special Courses (See Table 7.4).

Firstly, there are many formal and informal tests of subjects accompanied by exam pressure in primary schools, such as the Chinese Language, Mathematics and Science, because these are the instructional objectives for each subject announced by Taiwan's Ministry of Education. Teachers need to pay close attention to children's learning progress in order to meet these objectives; therefore, they usually prepare many small tests or worksheets after they finish one part of the lesson. The test itself takes half an hour and then there is a review. The children are informed of the test in advance because they need to prepare and review the lesson. In addition, parents are concerned about their children's test scores, not only in the formal examinations in the school, but also the small tests during the courses. Based on the data from these three schools, the tutor of the primary class usually asked the children to show their test sheets to their parents and ask them to sign them to ensure that the parents knew the results of

their children's learning.

Moreover, because teachers need to finish teaching the lessons before the examination, they are usually more serious when they teach these subjects and more careful about meeting the teaching schedule. Although teaching these subjects causes teachers pressure, they still utilise different pedagogies for each subject. The teacher in School C usually used didactic instruction when she taught the Chinese Language course. She explained the topics very carefully. For example, when she taught them new Chinese characters, she would ask the children to follow the correct stroke order and practice it together in the lessons. The children were also very familiar with this kind of teaching method and followed the teacher's instruction to practice by raising their fingers. After teaching them the stroke order, the teacher began to explain the meaning of the characters and used them to develop words or sentences. Because this was to be an examination, the teacher asked the children to write down the important sentences or use a coloured pen to mark the points in the textbook to remind them to review them before the exam. The climate in this course was usually not very open because the teacher needed to complete the process in time and she liked to ask the children to listen and follow her instructions instead of giving them more opportunities to express their ideas in the Chinese Language course.

However, the teachers in the Science course of Schools A and C still posed some questions in the hope that the children could express their thinking during the lessons. The teachers and the children were under pressure because there would also be a formal examination. However, the children had more opportunity to find the answers themselves since the lessons usually involved experiments that needed to be conducted by them and this learning climate was better than sitting and listening to

the teacher's explanations or instructions. Therefore, based on the data from the classroom observations, the teachers who taught Science tended to use many questions to lead the children's thinking during the lessons. The performance of children's PT was also higher than in other courses that are also accompanied by exam pressure.

Furthermore, the teachers' pedagogy in the Mathematics course was similar to the one in the Science course. Because some specific skills needed to be developed in the math lessons, teachers used many leading questions to guide the children step by step to enable them to obtain a correct and in-depth understanding of the mathematical concepts. Therefore, they usually asked "How" and "Why" questions during the lessons in the hope that the children could provide more detailed reasons for their thinking when solving math problems. Since mathematics does not consist of knowledge the children could recite and memorise, the teachers paid more attention to ensuring that they really knew how to use these mathematical skills to solve problems, not only in the textbooks or tests, but also in their daily lives.

Another subject I would like to discuss is Society. Compared to other subjects that are accompanied by exam pressure, the topics of the Society course are more interesting for children than the Chinese language or Mathematics and are also more related to daily life. In addition, there are fewer informal tests and worksheets for the Society course than other subjects. Therefore, the teacher who taught this course tended to include more conversations or discussions with the children and hoped that they would share their life experience related to the lessons. However, she still asked them to mark the important sentences to prepare for the formal examination and the climate became more serious then.

Secondly, teachers had less pressure when teaching subjects with non-exam pressure and they could design more interesting activities in these courses. Without formal instructional objectives, teachers had more space to design the teaching activities for their own class or combine them with other activities or competitions in the school. The topics in these kinds of courses were more varied and could be connected to the children's lives or previous experience; hence, the children seemed to be more relaxed and enjoyed performing the tasks in the classes in these courses. For example, in School A, the teacher who taught the Integrated Curriculum course usually provided activities that were combined with the school competition. During the period of classroom observation, the teacher sometimes designed tasks related to "Future Imagination". She asked the children to read specific books related to saving energy to enhance their concept of a 'Future Environment' because she hoped they could learn the importance of saving energy and protecting the environment. She also applied for a field trip, which involved the children attending a workshop of energy game tools, in the hope that they could obtain a better understanding of energy application. Based on the collected data, the children in School A were extremely interested when they attended the workshop and performed the activities in the lessons. Since the time in the Integrated Curriculum course is much more flexible than in courses for other formal subjects, the teacher initiated many discussions with the children and also provided them with opportunities to speak if they wanted to express their ideas.

In addition, the teacher who taught Computer Science in School A also combined the course with a festival, such as Christmas or New Year. One of the tasks for the children to complete during the lessons was to design an electric Christmas card with

pictures and music using a computer and the Internet. The children seemed to be more focused and interested in designing their cards because this activity was closely related to their everyday lives. In the same course, the teacher took time to help other teachers to complete some activities that required the use of a computer. For example, other tutors asked the Computer Science teacher to assist the children in their classes to register to take part in an Internet competition. Since the registration needed to be done on the website, the children learned how to obtain their ID and password using their iPad in the lessons. Since the topics were flexible and the teachers were able to decide what they wanted to teach in the lesson, the climate in these subjects was usually open and the children were more highly motivated to learn than in other formal courses.

Thirdly, there are some Special Courses that are not included in the formal course framework in Taiwan's primary education and one of these is the talented class in School B in this study. Many primary schools have a talented class for children who have a superior learning ability, but a talented class is not a class in the general sense of the word because the children still belong to their original class. Therefore, the courses in the talented class are special courses in primary schools and only for specific children. These courses are designed and provided by the teachers of the talented class. Although there are no formal instructional objectives in these special courses, teachers still need to submit a detailed proposal of the courses they would like to teach at the beginning of the term. The children's parents are invited to meet the teacher of the talented class so that they can understand the schedule and the teaching plans. There is also a presentation of the children's results at the end of term to ensure that their learning has progressed.

Because there is more flexibility and space for teachers to fully scope the lessons in the talented class, they can organise special events or modify the activities to facilitate better learning results. For example, in the classroom observation of the talented class in School B, the teacher aimed to develop and enhance the children's individual thinking skills as well as teach them how to conduct academic research. Two courses were observed in the talented class of School B, namely, Debates and Individual Research Design. During these lessons, the teacher not only paid attention to developing the related knowledge, but also the children's thinking skills.

In addition, since there were fewer children in the talented class than the primary class and the courses were not subjected to formal exams, the teacher could consider the learning performance of each child. There was evidence that one child seemed to find it difficult to participate in the activities during the lessons for almost a month. The child did not like to speak in class, was very quiet and was unable to focus. Therefore, the teacher invited the child to talk to him after the class so that he could understand his situation and issues. Then, he ordered him to express his ideas in the lesson and hoped he would improve. This example also showed that the teacher in the talented class could take more action or focus on all the children's needs during the lessons. He was able to use different ways to help each child based on the children's different learning progress.

Moreover, the teacher posed a great many questions to help the children to obtain an in-depth understanding of the teaching points. He also encouraged the children to express their ideas. On the other hand, because the topics of the lesson in the talented class were new and challenging, the children seemed to be more excited and enjoyed discussing the learning activities.

7.4.3. Background of Teachers' Training

Table 7.5 The background of teachers' training and years of teaching in three schools

	Teacher	The years for teaching	Related Training of Creative education
Case I- School A (Primary class)	Teacher A-1	8 years	Yes
	Teacher A-2	6 years	Yes
Case II- School B (Talented class)	Teacher B	10 years	Yes
Case III- School C (Primary class)	Teacher C	12 years	No
	Teacher D	30 years	No
	Teacher E	15 years	No

Due to the different cases in this study, 6 teachers were observed during the classroom observations. Children's PT is also influenced by different teachers' pedagogy. According to the background of the teachers in these three schools (See Table 7.5), their teaching pedagogy may have been different when they were teaching or faced with children's learning issues. This is not only related to the difference in teachers' number of years of teaching, but also their training background. For example, senior teachers seem to have more teaching experience; hence, they should understand the children's needs during the lessons and know what kind of teaching activities or methods would enable them to understand the new concepts in lessons in fast and

effective ways. On the other hand, some young teachers may not have as much teaching experience as their older counterparts, but their teaching training included courses related to children's individual thinking or critical thinking skills. They are young and highly motivated and they hope that they can help to develop the children's thinking skills and problem-solving ability. Therefore, even though they have little experience of teaching in primary schools, they are eager to try new teaching methods or join the new education policy or workshops that may enhance the children's learning ability. Therefore, the relationship between the teachers' training background of creativity or relevant issues and the pedagogies they used in the courses will be discussed in this section.

Firstly, three teachers in Schools A and B in this study had been trained in creative education. Schools A and B had also adopted the 'Future Imagination (FI)' policy, as represented by these teachers' classes. The reason for choosing these two schools as cases in this study was that these teachers' teaching activities could be observed and their interaction with the children based on the creative education policy. In these two cases, the teachers had attended workshops or courses related to children's creativity and imagination, future education and critical thinking. The teacher in the talented class of School B had also published an article related to children's creativity. All three teachers expressed their interest in ways to enhance children's creativity and problem-solving ability in the school. Therefore, they were more open to accepting a variety of answers or ideas during the lessons.

Based on the classroom observations in School A, teacher A-1 was the tutor in the class and teacher A-2 was the subject teacher. Teacher A-1 was extremely passionate and interested in children's creativity and she prepared some books that were not

textbooks that could be connected to the topics of the lesson to enhance the children's creativity and imagination. Because the children would be excited and more focused when they read these books, the teacher used a great many questions to interact with them to enhance their thinking ability. Moreover, teacher A-1 also found some activities related to creativity or imagination outside the school and took the children to participate in them in the hope that they would learn different knowledge and have new ideas afterwards. She designed some worksheets after attending the activities and asked the children to complete them. This enabled her to lead the children to express their ideas or share their experience together. Teacher A-1 spent a great deal of time preparing these kinds of activities. Fortunately, Teacher A-2 shared her passion and interest; hence, they not only exchanged views of children's creativity or teaching experience, but also cooperated when they needed help with their teaching activities. Their relationship could be said to be a teaching partnership, which was very helpful when either of them wanted to try some teaching activities that were not included in the formal curricula.

In the case of School B, teacher B had been trained in related courses when he studied in the graduate school. He also led the children of the talented class in creative competitions many times. This teacher not only had extensive teaching experience, but he was also passionate and possessed professional knowledge of children's creativity and critical thinking skills. His publications also showed that he had researched these topics and continued to broaden his perspective of them. When the observations were taking place, it was the second year he had joined the 'Future Imagination (FI)' project and during this year, he had tried to enhance the children's creativity and imagination in his two courses of the talented class, namely, Debate and Individual Research Design. According to the data, teacher B provided an open and

friendly climate for the children. He used a great many questions and discussions and also encouraged the children to express their ideas as much as they could. In addition, because his students were regarded as the talented students in the school, teacher B tried to provide them with some knowledge that might be taught in high schools or universities. Therefore, he not only taught the children the answers to problems, he also introduced different thinking skills, such as the 6 Thinking Hats, and hoped the children could apply them in the tasks during the lessons.

In short, although the teachers also needed to maintain the teaching schedule and some of them taught subjects that caused exam pressure, they retained their passion and introduced interesting activities during the lessons in order to enhance the children's creativity and imagination.

Another issue that needs to be addressed is related to those teachers who were not trained in creative education and what they did during their teaching. Because the concept of creativity is relatively new in the educational field, many senior teachers in Taiwan's primary schools have not been trained or attended courses related to this phenomenon. Although the MOE in Taiwan has promoted this issue for almost 10 years, some teachers still know little about creative education. However, although the senior teachers in this study may not have been familiar with teaching creativity in education, they did not deny the strength of this teaching method. It takes time to learn new theories or teaching methods to enhance children's creativity or imagination. Therefore, the government and universities are organising many workshops or seminars related to creative education in primary schools so that more teachers can have an in-depth understanding of this issue.

According to the classroom observations in this study, the teachers in School C had not received training related to creative education. Teacher C, who was the tutor of the class, had 10 years of primary school teaching experience. Teachers D and E were the subject teachers in the class and their teaching experience was 30 years and 15 years respectively.

Teacher C in School C was found to pay much attention to teaching the children good behaviour as well as academic knowledge. Because the children in School C were younger than those in the other two cases, it was evident that the tutor spent a great deal of time correcting their behaviour at school. Primary school teachers who teach young children have two important missions, namely, ensuring that the children adhere to the daily rules and designing and implementing the teaching schedule. This may be why teacher C did not organise extra activities to enhance the children's creativity or imagination. These kinds of teaching activities take a great deal of time to prepare and teachers would feel more pressure if they had to consider both issues. Therefore, they usually use the same teaching methods based on their teaching experience in order to maintain effective teaching during the lessons.

In addition, teacher E taught the Science course and he had a great deal of experience of primary school teaching. He also had his own teaching pedagogy and did not like to make too many changes in the lessons. Because his course involved scientific issues and included many experiments, he used questions to help the children to find the answer by doing the experiments. Based on the topics and teaching activities in the lessons, the pedagogy he used in the Science course was more creative than that of teacher C. However, he only made changes or included interesting activities when he was sure they would not delay the teaching schedule because Science also involves

formal exams. Moreover, his ample teaching experience enabled teacher C to better balance the teaching progress and time control when he wanted to provide some additional knowledge during the lessons.

Furthermore, teacher D was the subject teacher but she had already retired. She only came to school twice a week to teach art. This often happens in primary schools when retired teachers are asked to teach some courses that do not involve exams. As a senior teacher with an enormous amount of experience, she had no problem with teaching. However, abundant teaching experience is a strength for teachers, but it may also be a limitation because, as mentioned in the last section, senior teachers with a great deal of experience are likely to use their own teaching methods and be reluctant to change because they may find the new topics challenging. Moreover, senior teachers in primary schools are usually more than 50 years old and they are not familiar with the issue of creativity or educational psychology unless they have taken advanced studies recently. Based on the data collected in this study, teacher D usually used traditional teaching methods. For example, she told the children how they should draw a picture of the sun or trees. While this may be the fastest way for children to learn to use the correct colour and lines in drawing, their imagination may be limited when the teacher tells them what the sun or a tree should look like.

In summary, there is the difference between teachers' pedagogy and their background training. According to the short interview with the teachers in this study, they like to make changes if they have the time. This means that teachers are still pressured to maintain the teaching schedule and ensure that the children obtain good exam results. However, schools are now holding more and more workshops or seminars and primary school teachers can acquire more information and resources than ever to

become familiar with the new style of education. The schools can also encourage the teachers to participate in these kinds of activities. Since the participants of these workshops or seminars are likely to discuss and share their experience, the teachers may find some interesting ideas when they listen to other teachers or have discussions with them.

7.5 Conclusion

The findings of the study were discussed in this chapter, which was divided into two main parts. The first part contained a discussion about the children's PT and teachers' pedagogy in these three cases because the results showed that the levels of each feature of the children's PT in each school were different.

Based on the findings of children's PT, the evidence showed that the features of PT model in Taiwan reflect stage 2 and 3 of the PT model proposed by Cremin, Burnard, Dragovic and Chappel (2012) in their UK studies. It appears to confirm that the concept of PT developed by Craft (2001, 2002), where PT is described as a kind of everyday creativity and involves a relation to identify and resolve problems in our daily life, is present in the classrooms studies here. There are differences in frequency of each PT feature in this study, but nevertheless, these findings could still provide important insights and knowledge for the PT field on the presence of children's PT in a different cultural context, and in particular Taiwanese primary education.

The findings also indicated that the teacher's pedagogy had a huge effect on the children's PT and learning. Therefore, the different pedagogies used by the teachers in these three cases and their effect on the development of the children's creativity were

briefly discussed in the second part of the chapter.

On the other hand, as mentioned in the previous chapter, which is assumed to have had an effect on the conceptual framework, the findings also indicated that some elements and external factors would also affect the children's PT and teachers' pedagogy in Taiwan's primary education. Therefore, the way these factors affect teachers' pedagogy and children's creativity was also illustrated in this chapter.

This study will be concluded in the next chapter, Chapter VIII, which will also contain some reflections on this research and some proposals for Taiwan's primary education. The limitations of the research will be discussed in the last section of the chapter and some suggestions will be made for further research in this field based on those limitations.

Chapter VIII

Conclusion and Reflections

A brief review of the study is provided in this final chapter, together with some recommendations for the implementation of future policy and research in the field of creative education. Firstly, a summary of the findings is presented in accordance with the four research questions, and this is followed by the identification of the expected contributions of the research, as well as its limitations and some implications for future studies. Therefore, the chapter is divided into three main parts: summary of findings, contributions of the research, and recommendations for future studies.

8.1 Summary of main findings

The key findings in this chapter are expected to answer the following four research questions;

2. **How do children in Taiwan's primary schools use PT during the learning process?**
3. **What is the nature of teachers' pedagogical practices in Taiwan's primary schools?**
4. **What is the relationship between children's PT and teachers' pedagogy in Tawian's primary education system?**
5. **What factors and processes have contributed to changing teachers' creative pedagogy and children's PT in Taiwan?**

A multiple-case study was utilised as a research approach with a focus on three classes with very different characteristics in Taiwanese primary schools.

After reviewing the previous studies of PT and TP, the studies conducted by Craft, Cremin, Burnard, Dragovic and Chappel (2012) for children's PT and by Cremin, Burnard, and Craft (2006) and Lin (2011) for teacher's pedagogy were used as the main approach to the conceptual framework for this thesis. External factors, such as policy implementation, the curriculum structure, the background of classes, and teachers' professional training, all of which would affect the children's PT and the teachers' pedagogical practices, were included in the conceptual framework to explain the current status of Taiwanese primary education in depth.

8.1.1 Features and characteristics of the current PT in Taiwanese primary education

In response to the first research question about how Taiwanese students perform their PT during the teaching activities, it was found that the children's PT features shown in this study fit the PT model in stage 3 proposed by Cremin, Burnard, Dragovic and Chappel (2012) in their UK studies.

The children who participated were 8-12 years old and this corresponds to stages 2 and 3 in the UK's PT research. The finding for children's PT features in this study showed that 'Risk-Taking' was absent in school C, in which the children were aged 8-9 (stage 2 in the UK's PT study), but it was found in the other two schools, in which the children were aged 11-12 (stage 3 in the UK's PT study) and this accorded with the findings of previous PT studies in the UK.

The absence of "Risk-Taking" of PT also indicated that the teachers usually provided as much support as they could and gave clear instructions to help the children to build

a good understanding of the knowledge.

Therefore, the younger children were taught the correct way to solve their problems directly and they also became used to listening and following the teacher's instructions to prevent failure in the learning experience. In the Taiwanese primary education system, children are afraid to make a mistake because they are told to give the 'correct' answer and obey the rules in the class; therefore, they are not likely to express their ideas immediately until they think they may be correct or what the teacher wants to hear. This means that the older children in these primary schools, who had more knowledge and learning experience, were more confident to express their ideas during the learning activities. Moreover, they were not afraid to take a risk by proposing some special or unusual ideas when the teacher provided an open and supportive learning environment.

In addition, the children's PT performance in the features of Q-P and Q-R also represented the characteristics of children's usual behaviour in Taiwan's primary education. The evidence showed that the frequency of their use of Q-R was much higher than their use of Q-P in the primary class. This finding could also be related to the teacher's pedagogical practice. For example, if the teacher posed more questions to help the children to find the answer and provided them with opportunities to speak and express their thoughts during the lessons, the children also used their Q-R and Q-P skills to solve the problems or make decisions. They usually used their Q-P if they had a doubt about the teaching instruction or other children's ideas. When the teachers provided a more supportive learning environment, they were not unhappy if the children failed to give the correct or expected answers and the children were more likely to express their ideas and respond more in class; otherwise, they just sat and

listened and only answered the questions passively when the teacher asked them.

On the other hand, there is a feature called ‘peer cooperation’, which is found in stage 3 of the UK’s PT model and it was also found in this study. This means that, in Taiwan’s primary education, children try to find help from their classmates to solve their problems or ask them for ideas during the lessons. This PT feature was not only represented in the group mission activities in this study, but also the individual tasks. The children usually tried to ask their classmates first during the task and peer cooperation did indeed enhance their PT. The discussion between them enabled them to hear different viewpoints and this helped them to think in ways they did not usually use when they encountered problems.

Moreover, the evidence of the ‘Play’ and ‘Immersion’ PT feature showed that children would become more involved and interested in developing their ideas, solving their problems, or finding answers during the activities in which the topics or contents were new or related to their life experience. They were more likely to express their ideas, listen and respond to others’ ideas more positively. The children were also found to exhibit positive emotions. They enjoyed the learning activities very much as they became immersed in the discussion, which gave them more possibilities to develop novel ideas or products during the lessons.

However, the findings showed that the children in the primary class showed ‘being imaginative’ and ‘innovative’ features less frequently than those in the talented class because the teachers usually provided insufficient time and space for them to express their real ideas and were more likely to hope that they would give the correct or expected answers during the lessons. Therefore, the children performed more

creatively and expressed their imaginative ideas more in the learning activities when the teacher stood back and provided them with the time and space to develop their ideas and did not give them clear instructions as to the right or wrong answers.

In summary, the findings of the PT of the children in this study corresponded with the teachers' pedagogical practices used in the different courses and classes and affected the children's PT in these primary schools. Although the PT model for children in Taiwan's primary education matched the one in the UK's studies, there were different frequencies of the children's PT features in the three classes. This demonstrates that children's PT is indeed connected to teachers' pedagogy in Taiwan's primary education. It also indicates that some features, such as risk-taking, 'being imaginative' and 'innovation', were hardly found in the formal subjects with exam pressure because of the teacher's pedagogies or the impact of external factors.

8.1.2 Current TP in Taiwan's primary education

The findings of this study showed that the teachers used different pedagogical practices for different subjects or classes. The classroom observation of the children's learning activities in the different courses and different schools indicated that some teachers tried to use more creative pedagogies, such as providing the children with more flexible space and time to develop their ideas and a supportive climate in order to enhance their individual thinking, creativity and imagination. Some teachers used a traditional teaching method, such as didactic instruction, to impart their knowledge under strict control. There were also different PT performances from the children when they were subjected to different kinds of pedagogical practices during their learning.

The class in school A joined the FI policy implementation in the primary education stage and the teachers in this class were passionate about using their teaching to enhance the children's creativity and imagination. Moreover, because of the unique location of School A, the teacher also hoped that the children could develop more concern for the community and the earth's environment by teaching them the concept of future imagination. The teacher had been trained to enhance children's creativity and imagination in relevant courses at the university and workshops and seminars organised by the FI policy office. Therefore, the findings indicate that the teachers in School A usually provided a friendly and open learning climate and encouraged the children to express their ideas during the lessons, even if it took more time.

In addition, 'Posing Questions', such as leading questions, was frequently used in the teaching activities to help the children to develop their ideas and find the answers to problems themselves. The teachers also took time to prepare extra learning activities, such as science workshops for the children to participate in interesting scientific experiments organised by the university at the weekends. These kinds of learning activities were not included in the formal curriculum, but the teachers still spent extra time on the preparation and communicating with the parents in order to help the children to develop their creative thinking ability and learning motivation by participating in these interesting activities. In the case of School A, 'teachers' cooperation' in different subjects for a series of teaching activities about the same topics reduced the teachers' burden and provided support for creative teaching during the courses. Although the class in School A was a primary class and the teachers also had the pressure of teaching the formal subjects, they were still willing to use many different resources and creative pedagogical practices to help the children to develop their ideas and display their creativity and imagination during the lessons.

The class of School B was the talented class. Because of the characteristics of the talented class and its curriculum structure, the teacher had more flexibility in choosing the teaching topics, designing the teaching activities, and arranging the timetable to progress the students' learning. In addition, the small number of children in the class provided flexible space to allow the teacher to adjust the different teaching activities to match the progress of each child. The teacher usually used a child-centred teaching pedagogy to conduct the learning activities and provided the children with the space and time to express their thoughts, such as plenty of discussion during the lessons, and the use of various interesting or current popular issues to increase the children's motivation to learn. The children were also given group tasks during the lessons in the hope that they could develop their ideas by considering the different viewpoints of the group to complete their mission, such as organising a formal debate competition and some small-scale individual research. The findings also showed that the teacher's role in the talented class was that of a supporter. He usually encouraged the children to develop their own ideas and arguments during the lessons and used the 'stand back' pedagogy to enhance the children's individual thinking and lead them to achieve the goal of the teaching objectives. Although the students in the talented class usually became immersed in the activities and interacted a great deal with each other or the teacher, the teacher still had to fully prepare and design the curriculum and have the experience and ability to modify it immediately in response to incidents that happened in the class.

The findings showed that the teachers in School C usually used traditional teaching methods in order to reach the teaching goals and ensure that the children had learned the knowledge in the schedule. Thus, they gave didactic instructions to the children

and asked them to listen and follow the instructions to prevent incorrect answers. The evidence also indicated that the teachers seldom provided the children with opportunities to speak and express their ideas; hence, they just sat and followed the teacher's instruction during the class. Moreover, the teachers in School C also liked to give clear directives to teach the children 'what is right and what is wrong' when learning new knowledge and spent a great deal of time building the correct daily-life behaviour. Therefore, the teacher-centred teaching approach was used in the class of School C and it is also used in most primary classes in primary schools in Taiwan if the teacher does not have the related training or does not accept the challenge to teach creatively.

In the short conclusion of this part, in terms of the teachers' pedagogy in Schools A and B, the teachers in these two schools had been trained to teach creativity and they exhibited the highest level of interest, motivation and passion for enhancing the children's creativity and imagination. These schools had also voluntarily adopted the FI policy to implement teaching activities that helped the children to develop their ideas and build their knowledge of future imagination. Therefore, the findings showed that there were more creative pedagogical practices in the classes of Schools A and B than in those of School C, which had not implemented the MOE's FI policy. The teaching activities included more interaction or dialogue between teachers and children and the teachers usually provided the children with plenty of opportunities to express their ideas during the lessons.

Moreover, the learning climate was also supportive and open, which made the children feel comfortable and confident in the classes. However, there was one point in the findings of this study that indicated that the learning activities may not have all

been of one orientation. It was observed that the teachers changed their pedagogical practice during their teaching based on the topics or the children's reaction. Hence, both teacher-centred and children-centred approaches were used during one teaching activity in these Taiwanese primary schools. The teachers used the teacher-centred teaching approach first during the lessons to deliver important knowledge of the topics the children needed to learn. Then, they used the child-centred approach and creative pedagogical practices to lead the children to solve problems, find answers, make decisions or develop ideas related to the teaching topics in critical, creative, or imaginative ways during the activities.

8.1.3 Relationship between PT and TP

(a) Overview

The findings of the classroom observation of children's learning in Taiwan's primary schools in this study indicated that the teacher's pedagogy plays an important role in the teaching activities. This finding is consistent with the systems model for creativity in education proposed by Csikszentmihalyi and Wolfe (2000) in which the teacher's role in creative education is described as that of a 'gatekeeper'. Different teaching pedagogical practices are likely to increase or reduce the development of children's creativity or imagination during teaching courses, from a Big C to a mini-c. On the other hand, children's PT performance can also help teachers to interpret the requisite tools for children's creative learning, and provide an understanding of how creativity manifests itself in learning opportunities across educational settings (Burnard et al., 2006) so that they can modify their pedagogical practices in their future teaching.

Moreover, the findings of this study also illustrated that the teacher's creative pedagogy that can enhance the children's PT is 'invisible' in the context of the

classroom. For example, the teachers discussed a variety of topics, posed many questions, and encouraged the children to answer them, as well as express their ideas and become immersed in discussions about the learning topic. They also provided a playful and supportive environment to help the children to develop their creative and imaginative ideas, increase their self-determination ability, and strengthen their problem-solving skills. This kind of pedagogy not only enhances children's PT ability, but also fosters their autonomy and volition, and often leads to innovation.

Therefore, there is a close connection between teachers' pedagogy and children's PT. If teachers prefer to use scaffolding in the class as a child-centred form of instruction to support the children in finding answers or developing their knowledge, it will enhance the children's mini-creativity, since they may find more creative ways or ideas to solve their problems, develop their arguments or design creative products. Otherwise, the teaching goals can sometimes be achieved in a short time by adopting a traditional teaching pedagogy, such as didactic instruction. While this also helps the teacher to control most of the situations in the class, the children will not have a chance to express their ideas or they may be worried about giving the wrong answer and choose to just sit and listen to the teacher's instructions. Therefore, this kind of pedagogical practice may hinder children's ability to develop their creativity and individual thinking skills during the learning process.

(b) Influence of external factors on PT and TP

According to the findings of this study, notwithstanding the teacher's pedagogy, the learning climate and the environment, the different external factors in the social context also affected the TP first and then influenced the children's PT in the teaching activities. For example, it was indicated in the findings that the traditional test-based

pedagogical approach in Chinese society had an obvious impact on the teachers' pedagogical practices. Moreover, the general context of the class, such as the number of children, their ages, the different types of classes and different subjects also played a role in teachers' choice of appropriate teaching methods to achieve their teaching goal in the school's term timetable. In addition, the implementation of the FI policy could be seen to have made a difference to the TP in these three primary schools.

(i) Impact of the background of the class

The findings showed that the teachers usually used traditional teaching methods during the lessons, such as didactic instruction, to teach the younger children in order to enhance their understanding of the teaching topics more quickly and achieve more effective learning results. In addition, the younger children may not have reacted very quickly, posed questions or found problems during the lessons due to their insufficient background knowledge. Therefore, the teachers used the teacher-centred teaching approach by providing them with the correct answer or direct information to avoid failure in the learning experience.

In terms of the different class sizes, the evidence indicated that teachers with small-sized classes were able to be more flexible in giving all the children sufficient time and space to express their individual ideas during the lessons. Moreover, in small-sized classes, the teachers could pay careful attention to individual children's learning performance and use different ways to help them based on their different learning progress.

On the other hand, teachers who taught in large-sized classes also needed to pay attention to the timetable, since all the teaching topics needed to be taught before the

regular formal examinations at the end of every term. Therefore, the teachers with a large number of children in the class preferred to tell them the correct answer and the correct way to solve the problems without a discussion and they did not provide the children with many chances to speak during the lessons.

(ii) Impact of the curriculum structure

Taiwan's MOE is determined that children should be taught a variety of learning fields in the primary education stage and the relevant subjects can be divided into three types, namely, subjects with examination pressure, subjects without examination pressure, and special courses. Teachers' pedagogy and children's PT are different based on these different types of subjects.

The findings showed that the teachers paid more attention to the children's learning progress in the subjects with examination pressure. They provided more time for the children to test the learning outcome of the lessons in order to help them to pass the formal examination and also to meet their parents' expectations. There is more pressure on teachers to teach these kinds of subjects than the other two types. As for the children, their performance in the lessons is quieter and they usually just sit and listen to the teacher unless they are given a rare chance to answer the questions.

Based on the evidence from the subjects without examination pressure and the special courses, the children felt more relaxed and comfortable in the courses without formal exams. They were also more motivated to express their ideas and discuss them with their classmates. In addition, the teachers could organise more interesting discussions or activities in these courses, which promoted the children's interest in learning and enabled them to express their ideas more spontaneously. The performance of the

children's PT was also higher in these courses than in those with examination pressure.

(iii) Impact of the implementation of the FI policy and teachers' professional training

The teachers in the schools that had implemented the FI policy used more creative pedagogical practices during their teaching and they also demonstrated more passion and motivation in teaching creatively than their counterparts in the schools without the F1 policy. Therefore, although these teachers also needed to keep to the teaching schedule and some of them taught subjects with examination pressure, they maintained their passion and tried to organise more interesting activities during the lessons in order to enhance the children's creativity and imagination. In addition, the evidence also showed that the children were much more interested and became highly immersed in the activities related to the implementation of the FI policy.

It was observed that the school that had adopted the policy of creative education had the vision to enhance the children's creativity and this influenced the teachers in the school to apply a creative teaching pedagogy during the lessons. However, there was a difference between the teachers' pedagogy and their training background. The teachers in the schools without the FI policy readily confessed that they would like to make changes if only they had the time. This illustrates that these teachers are still under a great deal of pressure to keep to their teaching schedule and ensure that the children produce excellent examination results. On the contrary, the teachers who had been trained to develop the children's creativity and imagination using the creative pedagogy expressed more confidence in meeting the challenge of changing their previous teaching approach and also had more information and resources to become

familiar with this new style of education.

On the other hand, the number of years of teaching experience also affects the teaching pedagogy in primary education. Older teachers appeared to have more teaching experience and were better able to recognise the children's needs during the lessons and choose the appropriate teaching methods to help them to understand the new concept of lessons in fast and effective ways. They could observe the children's problems very quickly and provide them with support during their teaching activities. However, although the younger teachers did not have as much experience of teaching in primary schools as their older counterparts, they were observed to be highly motivated in helping the children to develop their thinking skills or ability to solve any problems they encountered at school. Hence, they were very willing to try new teaching methods, adopt the new educational policy, or attend workshops that could enable them to enhance the children's learning ability and develop their creativity, even though it was challenging for them to give due consideration to the teaching schedule.

8.2 Research Contributions

This research is expected to make two contributions. Firstly, it has identified the distinctive features of children's PT in Taiwan's primary education. Although PT is used in Western theory to great effect, there is a different strength of the performance of PT features during the learning activities in the PT model in Taiwan. Moreover, the thesis contributes to the understanding of the impact of the teacher's pedagogical practice on children's PT performance. With its combination of the aspects of teachers' creative pedagogy proposed by Cremin, Burnard, and Craft (2006) and Lin (2011), the

conceptual framework of this thesis broadens the model in explaining the relationship between children's PT and teachers' pedagogy in the context of Taiwanese education. Secondly, the study addresses the external factors that affect teachers' pedagogy and children's future PT and provides an insight into the relationship between the social context and the teaching and learning activities on the campus. It also contributes to the implementation of the policy to promote creativity in Taiwanese education by explaining teachers' difficulties and needs when attempting to change from their usual teaching habitat to creative teaching based on the policy.

8.2.1 Contribution to Theories of the PT Literature and to Taiwan's PT research

This section contains three contributions to Taiwan's PT research, the first of which is the provision of a clear explanation of the current PT model and its features during children's learning in Taiwanese education. The second contribution is related to the significance of the relationship between children's PT development and the teacher's pedagogical practices in the learning activities. The third is a reminder that it is also essential for PT research in Taiwan to pay close attention to the influence of external factors in the socio-cultural context.

There have been many empirical studies of PT in the UK since 2006 and 11 features related to three different learning ages have also been proposed. Therefore, in response to the lack of related research of PT in Taiwan, this study used a qualitative approach and a multiple-case study to focus on three classes with different backgrounds in the context of the implementation of the FI policy in order to investigate and obtain an overall comprehensive understanding of children's PT performance in Taiwan's primary education. During the three months of classroom observations in three cases, it was evident that there were differences in both the

children's PT and the teachers' pedagogical practice based on the different ages of the children, different subjects, and also different kinds of classes. Based on a conceptual framework that contains three dimensions, namely, the learner, the teacher and the environment, the findings of this study contribute an in-depth understanding of the current PT model and its features in 9-12 year-olds.

The findings also indicate that the PT model and features in Taiwan's education are consistent with the UK's PT model; however, by analysing each PT feature, some distinctive differences were found in the study in terms of the children's frequency of using PT in the learning activities, such as in different learning subjects or with different teachers' pedagogical practices. For example, the traditional teaching method, which entails teachers asking the children to listen and directly follow their instructions without giving them many opportunities to express their ideas during the lessons, is still very much preferred by teachers in Taiwan. Therefore, there was some evidence that the frequency of Q-P behaviour of the children in the lessons was lower than Q-R in this study. This behaviour would also normally be affected by teachers' teaching methods, such as asking many questions to lead and encourage the children to speak during the learning process.

Moreover, because of the different cultural and social backgrounds in Taiwan and the UK, the children's display of creativity was expected to be influenced by the teacher's leading methods, teaching attitudes, and the learning environment and climate during the lessons. Therefore, the study not only focused on the learner's aspect. It also included a combination of the models of creative pedagogy proposed by Cremin, Burnard, and Craft (2006) and Lin (2011) in order to build a conceptual framework to investigate the relationship and the possible effect of teachers' different pedagogical

practices and children's PT behaviour in the learning context. The results also confirmed that children would be more likely to use their PT ability to develop their creative ideas, solve their problems and make decisions if the teacher applied a creative pedagogy, such as providing a supportive climate or positive encouragement, giving the children space to express their ideas in the teaching activities.

In short, these findings correspond with those in previous PT research, namely, that PT can help teachers to interpret and adopt the requisite tools for children's creative learning, and provide an understanding of how creativity manifests itself in learning opportunities across educational settings (Burnard et al., 2006). There was also evidence that teachers' different methods of teaching in classroom activities, such as question-posing and creative learning, can facilitate children's PT. Therefore, the study also contributes to PT research in terms of the relationship and influence of teachers' pedagogy in the educational context.

In addition, the impact of external factors on teachers' pedagogy in the social context of the educational field was the main point of the discussion. According to my conceptual framework (Figure 3.11, Page 108), the central part is focused on children's PT, teacher's pedagogy and the learning environment. Also, there are four external factors which are very different to the previous PT studies in the UK. Because of the sociocultural difference in the Chinese country, these external factors could affect teacher's teaching strategy and impact on children's learning behavior. Therefore, this study provides a new viewpoint of the relationship between the social and culture factors and the relationship between children's PT, teacher's pedagogy, and learning environment.

The findings confirmed that the contribution of external factors, such as the structure of the curriculum, the environment in the class and the implementation of the policy all had an impact on the teachers' pedagogical practice and then influenced the children to exhibit their PT in different ways. Therefore, this research also provides an insight into the effect of external social factors in the context of the development of PT in Taiwan.

8.2.2 Contribution to Understanding the Impact of the Implementation of the FI Policy in Taiwan's creative education

Based on the influence of the cultural and social context in the development of creative education in Taiwan, the study also aimed to acquire an understanding of whether or not the implementation of the policy of creative education was useful for enhancing the teachers' creative pedagogical practices and the children's PT. The findings confirmed that the implementation of the FI policy in the three primary schools studied had indeed encouraged the teachers to use more creative teaching activities, attempt to make some changes in the learning environment or provide more supportive and open spaces for the children during the lessons. The teachers were found to be more focused and highly motivated in enhancing the children's creativity and imagination during the learning activities. Therefore, the FI policy had facilitated the teachers to take a more child-centred approach and it was evident that the children became totally immersed in their activities in the classes and displayed much more PT behaviour when the teacher adopted this creative way of teaching.

On the other hand, it was also found that the teachers in Taiwan are very interested in new developments, such as the enhancement of children's creativity in creative education. The government did not require all schools to adopt the FI policy; rather, it

was an attempt to express the idea of creative teaching and encourage more teachers to have an understanding of the significance of this new way of teaching to develop children's creativity and imagination. In illustrating the influence of the implementation of the FI policy on teachers' pedagogy and children's PT, it is also proposed that the teachers in this study found it difficult to promote this creative pedagogy in their classes because they were not sufficiently confident to make the necessary changes based on insufficient professional training. Changing their way of teaching without the relevant training would be a huge challenge for teachers. They would need time to prepare for the changes and they would also need to learn new skills and teaching methods to enhance children's creativity during their teaching.

Therefore, the importance of teachers' professional training in creative education is highlighted in this study, together with some recommendations for the future implementation of creative education policy in Taiwan, namely, that teachers should be given professional training that should be appropriately designed for them to acquire a clear understanding of the core concepts of the new policy. They should learn how to promote creative education by attending seminars or workshops organized by experts and experienced teachers who have the related knowledge in this educational field and can provide them with useful instructions on how to use different teaching activities to develop children's creativity and imagination.

8.3 Research Limitations and Implications for Further Research

The relationship between external factors, teachers' pedagogy and children's PT during learning activities in Taiwan's primary schools was explored in the previous chapters. Each of these issues has an impact on the others in terms of promoting creative education in Taiwan's primary education and requires different theoretical frameworks and literature. To include them in the limited space of a thesis would have diverted the focus from the issue of the impact of PT on early years and higher education and only emphasised different stages of primary education.

Many important issues emerged from the empirical data and these require further analysis. Firstly, further research could be focused on the different stage of Taiwan's education, such as higher education, high schools or early education. It would be of interest to teachers and educational policy makers to obtain more in-depth information about the features of the PT model in different age groups and how these are manifest in practice. In addition, this study pointed out that there are marked differences in children's PT performance. More work could be done to establish the role played by early educational experience, family attitudes, culture and socio-economic factors on the development of PT. Also, drawing on a wider sample from different cities in Taiwan, or rural areas, would also widen our understanding of PT theory in different contexts.

Secondly, this study also indicated that external factors in teacher's professional training could affect their pedagogy. In this study, the training is related to creative education. However, more investigation is needed into the kinds of teacher's professional training programmes which could support teachers on teaching methods for enhancing children's creativity. Research in this area could also provide important

information to the government when new policies for creative education are promoted.

In addition, there is a lack of analytical research of the relationship between children's PT and other related educational fields, such as children's motivation to learn, learning efficiency, or other issues related to cognitive psychology in education. Hence, there is a need for more holistic in-depth research into the different learning stages of schools to acquire a more detailed realisation of the development of children's PT in Taiwanese education.

Moreover, based on the findings of this study, the features of PT in Taiwan and the other two dimensions, the teacher's pedagogy and external factors, can be used to construct indicators to evaluate creativity teaching in order to effectively promote the creativity of students and successfully implement a creativity policy.

Reference

Amabile, T. M. (1997). Entrepreneurial creativity through motivational synergy. *Journal of Creative Behavior, 31*(1), 18-26.

Amabile, T. M. (1996). *Creativity in context: Update to "The Social Psychology of Creativity*." Boulder, CO, US: Westview Press

Amabile, T. M., and N. Gryskiewicz. (1989). The Creative Environment Scales: Work Environment Inventory, *Creativity Research Journal, 2* (4), 231–253.

Amabile, T. M.(1988). A model of creativity and innovation in organization, *Research in Organizational Behavior, 161*(10), 123-167.

Amabile, T. M.(1987). *The motivation to be creativity.* In S. C. Isaksen(Eds.), Frontiers of Creativity Research. (pp.223-254). New York: Bearly.

Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology, 45*(2), 357-376.

Aristeidou, V. (2011) 'Exploring the characteristics of students' possibility thinking and teacher pedagogy in the drama game method in Cypriot primary education', paper presented at ICSEI 2011 conference. Available from: http://www.icsei.net/icsei2011/Full%20Papers/0174.pdf (accessed 15 December 2015)

Babbie, E. (2007).*The practice of social research.* USA: Thomson Learning.

Bancroft, S., Fawcett, M., and Hay, P.(2008). *Researching Children Researching the World:5x5x5=Creativity.* Stoke-on-Trent: Trentham.

Bassey, M. (1999). *Case study research in educational settings.* Buckingham: Open University Press.

Barak, M.(2009). Idea Focusing versus Idea Generating: A Course for Teachers on Inventive Problem Solving, *Innovations in Education and Teaching International, 46* (4), 345–356.

Barrow, R. (1988). Some of observations on the concept of imagination. In K. Egan & D. Nadaner (eds.).*Imagination and Education* (pp.79-90) Philadelphia, PA: Open University Press.

Beghetto, A., & Kaufman, J. C. (2011). Teaching for creativity with disciplined improvisation. In R. K. Sawyer(Ed.). *Structure and improvisation in creative teaching*(pp. 94–109). Cambridge: Cambridge University Press.

Besançon, M. and Lubart, T. (2008). Differences in the development of creative competencies in children schooled in diverse learning environments, *Learning and Individual Differences, 18*, 381–389.

Bloom, P. (2010). *The Pleasure of Imagination.* The Chronicle of Higher Education. Retrieved from http://www.chronicle.com/article/The-Pleasures-of-Imagination/65678?cid=trend_right_t

Bjerstedt, A. (1982). Future Consciousness and the School. *Malmo, School of Education, University of Lund*, Sweden.

British Education Research Association (2011). The ethical guidelines for educational research. Retrieved from http://www.bera.ac.uk/publications/ethical-guidelines

Burnard, P., Craft, A., Cermin, T., Duffy, B., Henson, R., Keene, J., Haynes, L. & Burns, D. (2006). Documenting 'possibility thinking'; a journey of collaborative enquiry, *International Journal of Early Years Education, 14*(3), 243-262.

Cascio, J. (2009). Futures thinking: the basics. Retrieved from http://www.fastcompany.com/blog/jamais-cascio/open-future/futures-thinking-basics

Chan, C. and Chen, Y. (2011). Developing Imagination for Taiwan's Future: The Role That Education Can Play. *Journal of Educational Research and Development,100*, P23-52.

Chan, S., & Yuen, M. (2014). Personal and environmental factors affecting teachers' creativity-fostering practices in Hong Kong. *Thinking Skills and Creativity, 12*, 69–77.

Chang, W. (2014). Exploring Future Images of Sci-Fi Movies: Insights of Sci-Fi Fans" Future Imagination. Unpublished Dissertation: Taiwan.

Chang, H. (2013). Development of the Assessment Project for Future Imagination in Language Arts (English) Learning Area. Unpublished Dissertation: Taiwan.

Chang, Y., Kuo, H., & Wu, J. (2008). The Development of Taiwan Creativity Education Indicators Presented at the ICIE conference, Paris, France

Chappel, K., Craft, A., Burnard, P., & Cremin, T. (2008). Question-posing and question-responding: The heart of 'Possibility Thinking' in the early years Early Years, *Journal of International Research & Development, 28*(3), 267-286.

Chávez-Eakle, R. A., Lara, M. C., & Cruz, C. (2006). Personality: A possible bridge between creativity and psychopathology, *Creativity Research Journal, 18*(1), 27-38.

Chen, Y. (2014). The Effect of Future Imagination Career Planning Curriculum Program on the Future Imagination Disposition and Life Adjustment Ability for the High School Students. Unpublished Dissertation: Taiwan.

Chen, Y. (2013). Walking into the Time Tunnel to the Future: The Development of Assessment Project for Future Imagination. Unpublished Dissertation: Taiwan.

Chen, Y. (2012). The curriculum design and effect evaluation of "Nurturing future imagination and creative talent" of teacher empowerment workshop - A case of high school. Unpublished Dissertation: Taiwan.

Chen, J., Wu, W., & Chen, C. (2008). The Development of Taiwan Creativity

Cheung, R. H. P. (2016). The challenge of developing creativity in a Chinese context: the effectiveness of adapting Western creative pedagogy to inform creative practice, Pedagogy, *Culture & Society, 24*(1), 141-160.

Chiang, M. (2011). An Action Research on Developing the Instructional Program for Future Imagination About the Hometown Ludi. Unpublished Dissertation: Taiwan.

Chien, L. (2009). The relationship between teachers' emotional creativity and occupational well-being. Unpublished Dissertation: Taiwan.

Chu, J. (2013). An Action Research on Developing the Instructional Program for Future Imagination about"the20 Years Later". Unpublished Dissertation: Taiwan.

Craft, A. (2001). 'Little c Creativity', In *Creativity in Education* by A. Craft., B. Jeffrey, and M. Leibling (eds),45-61,London: Continuum.

Craft, A. (2002). *Creativity and Early Years Education.* London: Continuum.

Craft, A. (2005). *Creativity in schools: tensions and dilemmas.* Abingdon: Routledge.

Craft A., and Chappell, K. (2014). Possibility thinking and social change in primary schools, *Education 3-13,* 1-19.

Carft, A. (2015). Possibility Thinking: from what is to what might be. In The Routledge *International Handbook of Research on Teaching Thinking,* edited by R. Wegeif, L. Li, and J. C. Kaufman, 153-167. London: Routledge.

Craft, A., Chappell, K., & Twining, P. (2008). Learners reconceptualising education: Widening participation through creative engagement. *Innovation in Education and Teaching International, 45*(3), 235-245

Craft, A., Cremin, T., Burnard, P. and Chappell, K. (2007a). Developing creative learning through possibility thinking with children aged 3-7. In: *Creative Learning 3-11 and How We Document It* , Craft, A.; Cremin, T. and Burnard, P. eds. London, UK: Trentham.

Craft, A., Cremin, T., Burnard, P. and Chappell, K. (2007b). Teacher Stance in Creative Learning: A Study of Progression, *Thinking Skills and Creativity*, 2(2),136–147.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century.* New York, NY, US: Basic Books.

Grainger, T. Barnes, J. & Scoffham, S. (2006). *Creative Teaching for Tomorrow:*

Developing a Creative State of Mind, A Report for Creative Partnerships, Kent.

Craft, A., McConnon, L., and Matthews, A. (2012). Child-initiated Play and Professional Creativity: Enabling Four-Year-Olds Possibility Thinking, *Thinking Skills and Creativity*, 7(1), 48–61.

Cremin, T., Burnard, P., and Craft, A. (2006).Pedagogy and Possibility Thinking in the Early Years, *International Journal of Thinking Skills and Creativity*, 1, 108–119.

Cremin, T. (2015). Perspectives on creative pedagogy: exploring challenges, possibilities and potential. *Education 3-13, 43*(4), 353–359.

Creswell, J. W. (2011). *Educational research: planning, conducting and evaluating quantitative and qualitative research (4th ed.)*. Boston:Pearson.

Creswell, J. W. (2009). *Research design : qualitative, quantitative, and mixed methods approaches (3rd ed.)*. Los Angeles: Sage Publications, Inc.

Csikszentmihalyi, M. (2000). Creativity In Encyclopedia of psychology, Vol. 2. (pp. 28 337-342). Washington, DC, US: American Psychological Association; New York, NY, US: Oxford University Press.

Csikszentmihalyi, M. (1999). Implications of a systems perspective for the study of creativity. In *Handbook of creativity.* (pp. 313-335). New York, NY, US: Cambridge University Press.

Csikszentmihalyi, M. (1998). Creativity and genius: A systems perspective In *Genius and mind: Studies of creativity and temperament* (pp. 39-64) New York, NY, US: Oxford University Press

Csikszentmihalyi, M. (1996). *Creativity: Flow and the Psychology of Discovery and Invention.* New York: Harper Perennial.

Csikszentmihalyi, M., & Wolfe, R. (2000). New conceptions and research approaches to creativity: Implications of a systems perspective for creativity in education. In *International Handbook of Giftedness and Talents* (Heller) New York: Pergamon.

Crotty, M. (1998). *The foundations of social research: meaning and perspective in the research process*. Australia: Sage Publication.

Cropley, A. J. (1992). *More ways than one: Fostering creativity.* Nor-wood, NJ: Ablex Publishing Corporation.

Davies, D., Jindal-Snape, D., Digby, R., Hay, P., and Howe, A. (2013). CreativeLearning Environments in Education: A Systematic Literature Review, *Thinking Skills and Creativity*, 8, 80–91.

Davis, G. A. (1986). *Creativity is forever (2nd Ed)*. Dubuquc, Iowa: Kendall/Hunt.

Denscombe, M. (1997). *The Good Research Guide (3rd ed.)*. Buckingham: Open University Press.

Demosemlpva, N. S. & Nisskaya, A. K. (2016). The role of teacher-child interaction in promoting peer communication. *Psychology in Russia: State of the Art, 9*(3), 173-187.

Denzin, N. (1984). *The research act.* Englewood Cliffs, NJ: Prentice Hall.

Denzin, N. K. & Lincoln, Y. S. (2008). Introduction. The discipline and practice of qualitative research .in Denzin, N. K. & Lincoln, Y. S. (eds), *The landscape of qualitative research (3rd ed.)*. CA: Sage.

Dezuanni, M., and Jetnikoff, A. (2011). Creative Pedagogies and the Contemporary School Classroom, In *The Routledge International Handbook of Creative Learning*, edited by J. Sefton Green, P. Thomson, K. Jones, and L. Bresler, 264–272. London: Routledge.

Donovan, L., Green, T. D., & Mason, C. (2014). Examining the 21st century classroom: Developing an innovation configuration map, *Journal of Educational Computing Research, 50*, 161–178.

Duffy, B. (1998). *Supporting creativity and imagination in the early years* Philadelphia: Open University Press

Eisenhardt, K. M., (1989). Building Theories from Case Study Research. *The Academy of Management Review, 14*(4), pp. 532-550.

Eisenman, R. (1997). Mental illness, deviance, and creativity. In M. Runco (Ed.), *The Creativity Research Handbook*. NJ: Hampton Press Inc.

Fryer, M. (1996). *Creative teaching and learning*. London: Paul Chap-man Publishing Ltd.

Fang, H. (2012). A Study of Principals' Creative Leadership in Elementary Schools—Based on Creativity and Imagining the Future in Education: Grades 1-9 Action Plan. Unpublished Dissertation: Taiwan.

Galtung, J. (1982). Schooling, Education and the Future. Malmo, Sweden, Department of Education and Psychology Research, Lund University.

Gidley, J., Bateman, D., & Smith, C. (2004). Futures in Education: Principles, Practice and Potential. Australian Foresight Institute, Melbourne: Swinburne University of Technology.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In Denzin, N. K. & Lincoln, Y. S(eds), *Handbook of qualitative research (3rd ed.).* CA: Sage.

Hamel, J., Dufour, S. and Fortin, D., (1993). Case Study Methods. CA: Sage.

Hamlyn, D. W. (1995) 'epistemology, history of'. In: T. Honderich (ed.) *The Oxford Companion to Philosophy.* Oxford: Oxford University Press, 242-245.

Hamre, B. K., Pianta, R. C., Downer, J. T., DeCoster, J., Mashburn, A. J., Jones, S. M.,Brackett, M. A. (2013). Teaching through interactions: Testing a developmental framework of teacher effectiveness in over 4000 classrooms. *The Elementary School Journal, 113*(4), 461–487.

Hartley, J. F. (1994). Case studies in organizational research. In *Qualitative methods in organizational research: A practical guide*, edited by C. Cassell and G. Symon,

209–29. London: Sage.

Simons, H., (2009). *Case Study Research in Practice*. London: Sage.

Harris, A., and Lemon, A. (2012). Bodies that Shatter: Creativity, Culture and the New PedagogicalImaginary, *Pedagogy, Culture & Society*, 20(3), 413–433.

Hennink, M., Hutter, I. &Bailey, A. (2011).*Qualitative research methods*. London: Sage Publication.

Hu, B. Y., Wu, H., Curby, T., Wu, Z. & Zhang, X. (2018). Teacher-child interaction quality, attitudes toward reading, and literacy achievement of Chinese preschool children: Mediation and moderation analysis. *Learning and Individual Differences, 68,* 1-11.

Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal, 19*, 69-90.

Jeffrey, B. (2006). Creative teaching and learning: towards a common discourse and practice, *Cambridge Journal of Education, 36*(3), 399–414.

Jeffrey, B. and Craft, A. (2004). Teaching creatively and teaching for creativity: distinctions and relationships, *Educational Studies*, 30(1), 77–87.

Jeffrey, B. and Craft, A. (2006). Creative Learning and Possibility Thinking. In *Creative Learning Practices: European Experiences*, Jeffrey, B.(Ed). London: Tufnell.

Jeffrey, B. and Woods, P. (2003). *The creative school: a framework for success, quality and effectiveness.* London: Routledge.

Jia, X., Hu, W., Cai, F., Wang, H., and Li, J. (2017). The influence of teaching methods on creative problem finding. *Thinking Skills and Creativity, 24*, 86-94.

Joiner, R., Littleton, K., Faulkner, D. and Miell, D. (2000). (Eds.) *Rethinking Collaborative Learning*, London: Free Association Books.

Kuhn, T. S. (1970). *The structure of scientific revolutions.* Chicago: Chicago

University.

Kuo, H. (2014). *The Study of the Application of Imagination of the Future into Children's Art Learning Activities.* Unpublished Dissertation: Taiwan.

Kupers, E., Lehmann-Wermser, A., McPherson, G., and Geert., P. (2019). Children's Creativity and Systematic Review: A Theoretical Framework, Review of *Educational Research, 89*(1), p 93-124.

Kurtzberg, T. R., & Amabile, T.M. (2001). From Guilford to creative synergy: opening the black box of team-level creativity. *Creativity Research Journal, 13*(3), 285-294.

Lin, Y.-S. (2009). *Teacher and pupil responses to a creative pedagogy —Case studies of two primary classes in Taiwan*. Unpublished Doctoral Thesis, Exeter: University of Exeter.

Lin, Y.-S. (2011). Fostering creativity through education — a conceptual framework of creative pedagogy, *Creative Education*, 2(3), 149–155.

Lai, M. (2011). An Action Research on Developing the Instructional Program for Future Imagination about the " Myself in 2030 ". Unpublished Dissertation: Taiwan.

Lee, M. (2013). An Action Research on Integrating Design Thinking Model into the Instructional Program for Future Imagination：The Project of Designing the Sports Center on the riverside. Unpublished Dissertation: Taiwan.

Lee, W. (2012). An Action Research on "Developing the Instruction Program for Future Imagination" about "The Future Community ". Unpublished Dissertation: Taiwan.

Lin, M. (2013). The Development of Assessment Project for Future Imagination on The Future Career. Unpublished Dissertation: Taiwan.

Lin, W. and Chen, Y. (2011). *The 2011 final report of the guidance plan of the future*

imagination in Taiwan. Ministry of Education: Taipei

Liu, P. (2014). The Effect of Infusing Future Imagination into Visual Arts Instructional Program on the Imagination and Drawing Performance Ability of the Elementary School Students. Unpublished Dissertation: Taiwan.

Liu, Y. (2014). On the Primary School Future Environmental Education Based on the Integration of Future Imagination with Picture Books: A Case Study. Unpublished Dissertation: Taiwan.

Lucas, B. (2001). Creative teaching, teaching creativity and creative learning. In *Creativity in education,* A. Craft, B. Jeffrey, & M. Leibling (Eds.), London: Continuum.

Mason, J. (2002). *Qualitative researching*. London: Sage Publication.

Maynard, M. (1994). *Methods, practice and epistemology: The debate about feminism and research*. London: Taylor & Francis.

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review, 62* (3), 279–99.

MOE (2002). *White Paper on Creative Education*. MOE: Taipei.

MOE (2007). *White Paper on Local Creative Education*. MOE: Taipei.

MOE (2009). *Future Imagination and development of creative talent.* MOE: Taipei.

MOE (2013). *Future Imagination Education in Taiwan.* MOE: Taipei.

National Science Council (2009).The Final Report of the 8th Science and Technology Meeting. Retrieved from http://ap0922.most.gov.tw/tc/8th/doc/980115FINAL.doc

N.A.C.C.C.E. (1999). All our futures: creativity, culture and education (London, DfEE).

Niu, W., & Sternberg, R. J. (2001). Cultural influences on artistic creativity and its evaluation. *International Journal of Psychology, 36*(4), 225-241.

Organization for Economic Cooperation and Development (OECD) (2009). OECD

work on the international futures program. Paris, France: OECD publications.

Organization for Economic Cooperation and Development (OECD) (2007). Schooling for Tomorrow - The Starter pack：Futures Thinking in Action. Retrieved from http://www.oecd.org/edu/school/schoolingfortomorrow-thestarterpackfuturesthinkinginaction.htm

Pawson, R., & Tilley, N. (1997). R*ealistic Evaluation*. London: Sage Publications, Inc.

Peng, S. (2013). The Development of Assessment Project for Future Imagination about the " Western China in 2030 ". Unpublished Dissertation: Taiwan.

Prasad, P. (2005). *Crafting qualitative research. Working in the postpositivist traditions*. New York: M. E. Sharpe.

Qualifications and Curriculum Authority (QCA) (2005). Creativity: find it, promote it— promoting pupils' creative thinking and behaviour across the curriculum at Key Stages 1 and 2—practical materials for schools (London, Qualifications and Curriculum Authority).

Research Development and Evaluation Commission of Executive Yuan (RDEC) (2009). Vision: 2020. Retrieved from https://www.moj.gov.tw/HitCounter.asp?xItem=151271&ixCuAttach=37324

Rhodes, M. (1961). An analysis of creativity. Phi Delta Kappa, 42, 305-310.

Richardson, C., & Mishra, P. (2018). Learning environments that support student creativity: Developing the SCALE. *Thinking Skills and Creativity, 27*, 45-54.

Ritchie, J. & Lewis, J. (2003). *Qualitative research practice: A guide for social science students and researchers.* London: Sage Publication.

Runco, M. A., & Beghetto, R., A. (2019). Primary and secondary creativity. *Current Opinion in Behavioral Science, 27*, 7-10.

Ryhammar, L., & Brolin, C. (1999). Creativity research: Historical considerations and main lines of development. *Scandinavian Journal of Educational Research*,

43(3), 259-273.

Sawyer, R. K. (2004). Creative teaching: collaborative discussion as disciplined improvisation, *Educational Researcher*, 33(2), 12–20.

Sawyer, R .K. (2006). Educating for innovation, *Thinking Skills and Creativity*, 1, 41–48.

Sawyer, R. K. (2011). *Structure and Improvisation in Creative Teaching*. New York: Cambridge University Press.

Schoevers, E., Leseman, P., Slot, E., Bakker, A., Keijzer, R. and Kroesbergen, E. (2019). Promoting pupils' creative thinking in primary school mathematics: A case study. *Thinking Skills and Creativity, 31*, 323-334.

Singer, J. L. (1999). Imagination. In M. A. Runco & R. S. Albert (Eds.), *Encyclopedia of Creativity* (pp. 12). San Diego, CA: Academic Press.

Simon Fraser University (2011). The imaginative education research group. Retrieved from http://www.ierg.net/

Stake, R.E. (1995). *The Art of Case Study Research: Perspective in Practice*. London: Sage.

Sternberg, R. (2010). Teaching for Creativity, In *Nurturing Creativity in the Classroom*, edited by R.A. Beghetto and J. C. Kaufman, 394–414. Cambridge: Cambridge University Press.

Sternberg, R. J., & Lubart, T. I. (1991). An investment theory of creativity and its development *Human Development*, *34*(1), 1-31

Soh, K. (2017). Fostering student creativity through teacher behaviors. *Thinking Skills and Creativity, 23*, 58-66.

Torrance, E. P. (1978). Helping your gifted child learn about the future, *Gifted Child Today, 1*, 28-29.

Tsai, J. (2014). A Case Study on Developing the Instructional Program for Future

Imagination about the “Future Disasters”. Unpublished Dissertation: Taiwan.

Toivanen, T., Halkilahti, L., and Ruismäki, H., (2013). Creative pedagogy - Supporting children’s creativity through drama. *The European Journal of Social & Behavioural Sciences*, p.1168-1179.

UNESCO (2006). Teaching and learning for sustainable future. Retrieved from http://www.unesco.org/education/tlsf/

Walker, R. (2002). Case study, case records & multimedia, *Cambridge Journal of Education, 32*(1), 109–127.

Watkins, C., and Mortimore, P. (1999). Pedagogy: what do we know? In’ Mortimore P (ed) *Understanding Pedagogy and its Impact on Learning*’, edited by Peter Mortimore, 1-19, London: Sage.

Wu, I. (2011). Developing the Scale of Future Imagination Disposition. Unpublished Dissertation: Taiwan.

Wu, J. (2008). Planting the Seeds of Creative Education in Taiwan: Some Examples of Down-to-Earth Programs. Presented at the World Creativity Summit 2008, Taipei, Taiwan

Wu, J., Lin, W., & Lin, S. (2002). International Development and Trends in Creativity Education In *Ministry of Education's White Paper on Creative Education* Taipei: Ministry of Education.

Yin, H. (2011). An Action Research on Developing the Instructional Program for Future Imagination about Future Learning Center. Unpublished Dissertation: Taiwan.

Yin, R. K., (2009). *Case study research: Design and methods* (4th ed.). London: Sage.

Zellermayer, M., & Ronn, P. (1999). Making tacit knowledge visible through interplay between action research and videotaping, *Teachers and Teaching: Theory and Practice, 5*(2), 243–266.

Zeng, L., Proctor, R. W. and Salvendy, G. (2011). Can Traditional Divergent Thinking Tests Be Trusted in Measuring and Predicting Real-world Creativity? , *Creativity Research Journal, 23*(1), 24–37.

Appendices

Appendix 1: Consent Form

Parental Consent Form
for Participation in Research

I give my consent for my child (_____) to participate in the research titled, "'Possibility Thinking' in Taiwan's Education System " which is being conducted by PhD Student LI-JUNG CHIEN, Institute of Education, University of London. I understand that this participation is entirely voluntary; I or my child can withdraw consent at any time without penalty and have the results of the participation, to the extent that it can be identified as my child's, returned to me, removed from the research records, or destroyed.

1. This research seeks to determine 'Possibility Thinking (PT)' changes in students brought about by Taiwan's recently introduced creativity education programme. It aims to explore what constitutes 'PT' in the learning experiences of students, and how teachers foster students' PT as an aspect of creativity.
2. The procedures are as follows: The research project will take place for two months. During that time, the researchers will be collecting data using a variety of instruments and techniques(interviews, classroom observation, video recording). I understand that the researchers might be asking my child to participate using a combination of these data collection instruments and techniques.
3. No discomforts or stresses are foreseen.
4. No risks are foreseen. My child's participation is voluntary. I understand that my child will be given alternative, equivalent exercises if I or my child do not consent to participation. This choice will not effect the grade of my child.
5. The results of this participation will be confidential, and will not be released in any individually identifiable form without the prior consent of myself and my child, unless otherwise required by law. The interviews and observations will be taped (audio and video). Access to the tapes will be restricted to the researchers and graduate assistants directly involved with the research project. The tape will be stored in a secure area (e.g., locked filing cabinet) and the tapes will be destroyed one year after the completion of the study. The tapes will be transcribed, and the words of my child may be quoted. If so, a pseudonym will be used to ensure that my child cannot be identified in any way.
6. The researchers will answer any further questions about the research, now or during the course of the project, and can be reached by phone at +44-744[illegible]3 or +886-93[illegible]0.

Please sign both copies of this form. Keep one and return the other to the investigators.

_____ _____

Signature of Researcher Date

_____ _____

Signature of Parent/Guardian Date

Research Assent Form

I agree to participate in the research titled, "'Possibility Thinking' in Taiwan's Education System " which is being conducted by PhD Student LI-JUNG CHIEN, Institute of Education, University of London. I understand that this participation is entirely voluntary; I can withdraw consent at any time without penalty and have the results of this participation (up to the date of withdrawing), to the extent that it can be identified as mine, returned to me, removed from the research records, or destroyed.

1. This research seeks to determine 'Possibility Thinking (PT)' changes in students brought about by Taiwan's recently introduced creativity education programme. It aims to explore what constitutes 'PT' in the learning experiences of students, and how teachers foster students' PT as an aspect of creativity.
2. The procedures are as follows: The research project will take place for two months. During that time, the researchers will be collecting data using a variety of instruments and techniques(interviews, I agree to participate in the research titled, "'Possibility Thinking' in Taiwan's Education classroom observation, video recording). I understand that the researchers might be asking me to participate using a combination of these data collection instruments and techniques.
3. No discomforts or stresses are foreseen.
4. No risks are foreseen. My participation is voluntary. I understand that I will be given alternative, equivalent exercises if I or my parent/guardian do not consent to participation. This choice will not effect my grade.
5. The results of this participation will be confidential, and will not be released in any individually identifiable form without the prior consent of myself and my parent/guardian, unless otherwise required by law. The interviews and observations will be taped (audio and video). Access to the tapes will be restricted to the researchers and graduate assistants directly involved with the research project. The tape will be stored in a secure area (e.g., locked filing cabinet) and the tapes will be destroyed one year after the completion of the study. The tapes will be transcribed, and my words may be quoted. If so, a pseudonym will be used to ensure that I cannot be identified in any way.
6. The researchers will answer any further questions about the research, now or during the course of the project, and can be reached by phone at +44-74[illegible]8 or +886-93[illegible].

Please sign both copies of this form. Keep one and return the other to the investigators.

Signature of Researcher	Date
Signature of Student	Date

教育部未來想像政策下小學學童可能性思考之研究
參與學生家長同意書

親愛的家長您好：

我是目前就讀於英國倫敦大學教育學院(Institute of Education, University College London)的博士生簡莉蓉，很高興能有這次的機會與您進行聯絡。

由於富安國小在這幾年參與教育部未來想像計畫的豐富經驗與豐碩教學成果，受到教育部及許多教育領域專家的肯定，希望能夠透過貴子弟所就讀的六年乙班進行關於臺灣未來想像政策下小學學童的可能性思考能力的展現之研究。

本研究的目的在於探究小學學童在平常學習活動中「可能性思考(Possibility Thinking)」(一種存在於日常生活、學習活動中的小創造力)能力的展現，以及教師如何藉由教學活動提升學童的可能性思考能力，給予臺灣創造力教育更多的反思與回饋。

在研究過程中，為求明確分析學童的可能性思考的模式與展現方式，本研究會進行教室觀察的影音紀錄。為了保護您的小孩的隱私，所有收集到的資料僅供本學術研究分析之用，並且不會公開個人的資料。此外，教室觀察的過程中，教師與學生僅需表現如同平日的教學活動即可，研究者並不會介入任何的教學活動。

如果您同意您的小孩參與這個研究，請您在「參與學生家長同意書」上簽名或蓋章，如果您對本研究有任何疑問或不清楚的地方，更歡迎隨時與我聯絡，感謝您的協助！

敬祝

平安、順心

英國倫敦大學教育學院博士生 PhD Student of Institute of Education, University College London.
簡莉蓉　敬上
E-mail: chri @gmail.com or lc @ioe.ac.uk
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參與學生家長同意書

我已經獲得研究者的解釋，瞭解此研究過程的目的。茲同意本人子女參與倫敦大學教育學院簡莉蓉博士生之「教育部未來想像政策下小學學童可能性思考之研究」，並於研究期間同意研究者進行教學活動之影音紀錄。

學生基本資料：___年____班 姓名：_____

法定代理人（家長或監護人） 簽名：_____

時間：民國 ___年_____月_____日

Appendix 2: Observation Note

Classroom Observation Field Work Note		Video File Number:
School__ , Class___ , Subject_____, Teacher_____ Date: Time:		
Learning Activity Description		Note
09:00-09:15 a.m		