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Is Image Analysis Based on Gestalt Theory a Valuable Approach to Teaching Photography?

Wei Yuan Lu

First Supervisor: Professor Michael Fleming
Second Supervisor: Professor Jim Ridgway

A Thesis Submitted for the Degree of Doctorate of Education

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School of Education
Durham University
2008



1 2 JAN 2009

Abstract

The general aim of the thesis is to justify the claim that image analysis based on Gestalt psychology can be helpful in improving students' understanding and practice in photography. The thesis firstly identifies the technique-led curriculum as the major problem in photographic education in Taiwan as well as in the teacher-researcher's classroom. A new teaching programme integrating image analysis with Gestalt theory was formulated at the beginning of the target semester, in an attempt to develop students' ability to produce and appreciate photographs.

A set of empirical procedures, including data collection and analysis, has been adopted to assess student learning outcomes. An Effect Size measure has been used for evaluating student portfolios, as it is an accurate and appropriate approach to reporting and interpreting the effectiveness of educational intervention. The results are assessed from the teacher's perspective. Thematic Analysis (Boyatzis. 1998) has been adopted to analyze learning diaries, which express opinions from the students' perspectives. The collection and analysis of the data from different perspectives is carefully planned and conducted, serving a triangulation purpose.

Assessment results of the student work show an overall positive effect on their learning, either from the perspective of the teacher or from the perspectives of the students. However, the findings also reveal that when the learners tried to apply Gestalt principles in practice, they faced two major difficulties. The first relates to the gap between theory and practice, and the second to the seeming contradiction between intuitive thinking and intellectual thinking in the image composing process. These issues have not been fully addressed in the study and are considered worthwhile for further research.

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Copyright Declaration

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Chapter 1 Introduction

Photography is frequently perceived as simply a method of recording or a tool of communication. This view is reflected in the design and delivery of most courses in photography at educational institutions, which tend to deal with the technical and practical aspects of the photographic process (see for example Edexcel, 2005; Guide to Education 2005-2006 website). However, photography is also a powerful medium for self-expression or artistic creation, something it has in common with many other visual art forms. Given the importance of photography, it seems reasonable to suggest that not only should photography students to some extent engage with it as a means for the production of imaginative work, they should also be educated in terms of the ability to appreciate their own work and the work of others. However, in Taiwan, the country with which this research is concerned, photographic education at university level falls far short of this expectation. Experienced photography educators such as Wu (Wu, 1985, 1986, 1993, and 1998) and Chiang (2002) have identified three major problems in this field:

- the absence of photography departments in the higher education system in Taiwan;
- a lack of qualified, academic staff;
- the inclusion of photography courses in colleges and universities, with rare exceptions, as a component of media programmes rather than a separate entity.

Currently, there are only 25 full-time photography teachers among a total of 162 colleges and universities in the entire country (Hsieh & Lee, 2005). The photography curriculum is most often perceived as a form of technical training or, even worse, a channel for photography teachers to parade their skills, lacking basic academic orientation or status (Wu, 1985). Summarizing the results of their study, Hsieh & Lee (ibid) identify a total of 19 photography subject-areas in terms of the degree of importance and future demand, of which only 5 subjects[1] (26.3%) can be seen as of a non-technical nature. Furthermore, 2 of the 5 subjects, 'Psychology and Aesthetics' and 'Introduction to Art', are only slightly related to photography. In short, the absence of qualified teachers and a technique-led curriculum are the serious defects of the status quo.

[1] Those are: 'Psychology and Aesthetics', 'Introduction to Art', 'Photography Art', 'History of Photography and Creation' and 'Study of Photography Styles'.

Within the present educational context, photography students tend to perceive learning photography as learning photographic techniques. As an experienced teacher in vocational and academic photography courses, I have found that practitioners who have learned photography solely as technique (lacking basic training in visual psychology) quite often produce images of literal representation. They have difficulty in perceiving the dynamic relationship between visual elements or grouping the elemental parts together into a whole (a Gestalt). In sum, their works can barely go beyond mere representation and therefore lack a quality of visual connotation and association.

Another problem emerges when evaluating the quality of a photograph. The aforementioned photographers fall short of the criteria for judging images except for obvious technique aspects such as focus and exposure or a simple account of the content. It seems that these photographers' typical response to a photograph is either 'I like it' or 'I don't like it', that is, they were only responding to the subject matter. 'Form' in this sense is often overlooked.

The discipline of Gestalt psychology of perceptual organization may be able to help photography learners overcome such difficulties. The starting point of Gestalt theory[2] is that with regard to visual images, such as paintings or photographs, human beings respond to certain configuration of visual elements in a simple and coherent way. That is, there exist objective principles which are helpful in judging the effectiveness of visual images. A gifted artist may apply these principles, or break the rules, unconsciously or intuitively in producing his or her own works. As for ordinary learners, few of them have a naturally acute sense of image, but in terms of applying those principles to produce desirable outcomes this can be achieved through formal Gestalt training.

This study endeavors to show that Gestalt training is a viable, alternative approach to the technique-led curriculum, as it is an attempt to promote growth in both the productive and appreciative aspects of photography.

1.1 Purpose of the Study and Research Questions

Wu argues that we respond to the content in a visual field at three hierarchical levels, these are (1993: p.6-7):

---

[2] This study limits the scope of Gestalt theory to the field of visual perception.

1, the subject matter;
2, the whole (Gestalt) made up of interrelated visual elements;
3, the symbolic meanings.

Wu believes that photographers with a purely technical background are unable to reach a level higher than the subject matter. This accords with my personal experience as a teacher of photography. I started to teach photography for general purposes in a non-governmental organization in the year 1997. Three years afterwards in 2000, for the first time, I taught certain academic courses in photography at a private university. In March 2003, I began to give lectures on photography at a well-known Taiwanese university, National Tsing-Hua University, from which I graduated in 1986. In terms of the 400 to 450 photography students and photographers I have taught or met over the past 9 years, the phenomenon observed by Wu is not at all uncommon. Similar sentiments were also expressed by some photography educators (e.g. Siegel, 1983; Chiang, 2002).

Obviously, this phenomenon is closely related the abovementioned technique-led curriculum, which has limited the scope of learners' production and appreciation of photographic images. Similarly, the photography courses I taught were also imbalanced, focusing more on the productive processes such as exposure or composition, while the appreciative aspect was often overlooked. To remedy the situation, I decided it might be beneficial to introduce Gestalt theory into the course[3], namely 'Image Aesthetics', which I was teaching at NTHU. The new curriculum adopted a theoretical approach to teaching photography through image analysis, drawing on Gestalt laws of perceptual organization. The main purpose of this study is to examine whether the curriculum can help the students move up a step on the appreciation and production ladder of photography. In more specific terms, whether the students can develop a greater appreciation of photographic images and a greater ability to produce imaginative work are the key issues that need to be addressed in this paper. It is on these premises that a main research question and three subsidiary questions were formulated. The research questions are as follows:

Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography?

---

[3] It may be inappropriate to use the word 'introduce', because in the past there was a certain degree of overlap between the teacher's course content and the content of Gestalt psychology.

Subsidiary questions:

- Is image analysis effective in developing students' ability to appreciate and produce photographs? The appreciation of photographs, in this research context, is defined as the ability to analyze and critique photographs using Gestalt theory. The purpose of this research question is to measure the effects of Gestalt experiences on student learning outcomes, focusing attention on the production and analysis of images.

- What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory? This question is to be answered by a detailed analysis of learning diaries, addressing the issues which express students' personal interests, opinions and experiences in their learning.

- Have students' learning experience of Gestalt theory influenced their image composing processes? This question is to examine whether students have thought over and utilized Gestalt concepts when composing photographs.

1.2 Significance of the Study

In determining the significance of the study, the researcher needs to address to what extent the findings are useful concerning the following issues:

- How might it be of benefit to the participants in the study, the teacher and the students, and therefore of significance to them?
- To what extent do the findings increase and deepen understanding of the phenomenon studied, and therefore are of significance to photography educators and researchers (Rossman & Rallis, 2003: p.130; Patton, 2002: p.467)?

In short, this study intends to promote a better understanding of students' experience of learning photography, which is of particular significance for the target students, the teacher-researcher and prospective reviewers.

Significance for the target students:

- Appreciation: the students may develop a better understanding of how photographs are constructed and an ability to analyze photographs.

- Production: the students may reconsider how to organize visual elements in a photograph to produce more imaginative work.

Significance for the teacher:

- The portfolios and diaries from the target students may help the teacher to refine his teaching strategies and lesson plans to fulfill future students' needs for analyzing and producing photographs.

Significance for photography educators:

- The 'Image Aesthetics' curriculum, as the main subject of this study, could provide photography educators with an alternative approach to teaching photography, focusing more on theoretical analysis instead of technical training.

- Assessment criteria and instruments developed in this study could help photography teachers overcome problems such as highly subjective or inconsistent judgments on students' work.

Significance for photography researchers:

- Although learning diaries as a data collection device is not something new to academic circles, its use is fairly new to researchers in the field of photographic education; the development and exposition of common themes expressing students' personal interests, opinions and experiences in photography learning may be useful for researchers in this field.

1.3 Organization of the Thesis

The thesis is divided into five sections, comprising a total of seven chapters. They are:

1. Chapter 1 Introduction;

2. Reviews of literature:
   - Chapter 2 Gestalt Theory and Photography,
   - Chapter 3 Assessment in Photography;

3. Chapter 4 Methodology;

4. Findings and Interpretations:
   - Chapter 5 The Teacher's Perspective,
   - Chapter 6 The Students' Perspectives;

5. Chapter7 Conclusions and Recommendations.

Chapter one is the introductory chapter which gives the motivation for the arguments, purpose of the study, significance of the study and organization of the thesis. It begins by describing the context in which a concern about current trends and major problems of photographic education emerged. Within this broader context, the author provides an alternative approach to photographic teaching, drawing on Gestalt psychology, in an attempt to promote growth in both the productive and appreciative aspects of photography. It then outlines the overall aim with a main research question and three subsidiary questions that direct the structure and purpose of the study.

Chapter two is a review of the literature on Gestalt theory of visual perception, drawing heavily on Rudolf Arnheim's theoretical framework. Discussions are focused on the ways we respond to visual images, assuming the existence of common visual languages or visual grammar (Wu, 1993). Implications are then drawn from those views for a theoretical discussion linking Gestalt theory to art and photography. A critique of the strengths and limitations of Arnheim's theory is also provided in this chapter.

Chapter three is a review of the literature on assessment in photography. There is very little literature which bears directly on photography teaching and assessment in academic circles (Newbury, 1995; Rogers and Allen, 1996). The existing publications or articles either focus on the vocational training aspect of photographic education (e.g. Edexcel, 2005) or serve only as guidance for school or university teachers and students (e.g. Canada Department of Education website: www.education.gov.ab.ca). Therefore, discussions are confined to the existing articles and assessment literature in general.

Chapter four is the methodology chapter which elaborates the methods used to collect, analyze and interpret two main types of data, namely student portfolios and learning diaries. A set of assessment criteria and an analytical scoring rubric were developed for evaluating the portfolios. The results are assessed from the teacher's perspective. Thematic Analysis was adopted to analyze the learning diaries, which express opinions from students' perspectives. The collection and analysis of the data from

different perspectives was carefully planned and conducted, serving a triangulation purpose. A pilot study was conducted before the main study, and results are reported with suggestions for several revisions to the research design. Discussions of reliability and validity issues (dependability and credibility in Lincoln and Guba's terms, 1985 & 1999) are also included in this chapter.

Chapter five gives a detailed report and a comprehensive analysis of the major findings from the student portfolios. The results are reported systematically guided by the research questions. Detailed statistical or quantitative analyses using figures and tables are presented for data interpretation and summary. Descriptions of a joint evaluation between the author and a second assessor for the portfolios are also provided to ensure that the assessment instruments and procedures are reliable.

Chapter six presents the findings from the student learning diaries. In terms of the diaries, Thematic Analysis (Boyatzis. 1998) was used to identify and clarify certain common themes of the target students' learning experiences. The themes are reported systematically according to the research questions and presented concurrently with direct quotations, addressing the issues which give voice to students' personal interests, opinions and experiences in their learning. Furthermore, the results were fed back to the student participants, and their responses analyzed as an approach to verifying the findings.

Chapter 7 is the final chapter of the thesis. It considers whether the research evidence presented in the study is supportive of the main argument that image analysis is a valuable approach to teaching photography. At the end, the chapter suggests important areas for future research and comments on lines of inquiry that may be more beneficial to an understanding of students' experience of learning photography.

Chapter 2 Gestalt Theory and Photography

There are educators who argue that Gestalt principles of perceptual organization can be used constructively for art education (e.g. Efland, 1979; McWhinnie, 1992), but whether these principles are appropriate and applicable to photographic education, this is seldom mentioned in the literature. The issue concerning the applicability of Gestalt theory to photography teaching and learning is the main focus of the teacher's course 'Image Aesthetics'[1], and a primary concern of this research study.

There are of course other approaches to teaching photography, such as using semiotics, focusing on aesthetics and exploring the history of photography. However, the approach using Gestalt was thought to be particularly appropriate for the students in this context. Many of them came to the course with expectations that the focus would be on technical training. It was thought that for all students the Gestalt approach would provide a means to help them move from technical to aesthetic considerations.

This chapter will review the content, applicability and limits of Gestalt theory for the following reasons: first, Gestalt theory was central to the teaching intervention, therefore the research and in particular the data analysis will be better understood with some knowledge of the theory; second, Gestalt theory as applied to art and photography can be easily misunderstood if some knowledge of the details is not acquired. This chapter will be presented in 9 sections, ordered as below:

2.1 Field theory and Gestalt
2.2 Figure-ground
2.3 Gestalt principles of perceptual organization
2.4 Visual balance
2.5 Simplicity
2.6 Visual dynamics: simplicity is not enough
2.7 Gestalt psychology and art
2.8 Gestalt psychology and photography
2.9 Criticism of Gestalt theory

These 9 sections may be briefly described as follows. Sections 2.1 to 2.3 are about basic concepts and principles of Gestalt theory; sections 2.4 to 2.6 centre on

---

[1] It seems appropriate to be renamed 'Gestalt Photography', because the curriculum was primarily based on Gestalt theory.

Arnheim's expanded and renewed Gestalt theory, that is, our visual perception consists in the experiencing of visual forces, and the result of this highly dynamic process is the object as we see it (Arnheim, 1974: p.412; Kennedy, 1980); sections 2.7 to 2.8 deal respectively with the applicability of Gestalt theory to art and to photography; finally, section 2.9 discusses the limitations and difficulties of Gestalt theory.

2.1 Field theory and Gestalt

Although Max Wertheimer is to be credited as the founder of Gestalt psychology, the concept of Gestalt itself was first introduced in contemporary philosophy and psychology by von Ehrenfels in his famous work *Über Gestaltqualitäten* ("On the Qualities of Form", 1890). In his essay that gave Gestalt its name, Christian von Ehrenfels pointed out that if each of twelve subjects listened to one of the twelve tones of a melody, the sum of their experiences would not equal to the experience of someone listening the whole melody (Arnheim, 1972: p.5). For Ehrenfels this form or Gestalt quality represented an added element to an elementalist or atomist concept. His view differed from that of Gestalt theory which claimed that form emerges from intrinsic configuration of parts (Marks, 2008).

The Gestalt school of psychology was originated in Germany about 1912 by Max Wertheimer as a reaction to the prevalent psychological theory of the time, i.e. structuralism (e.g. the work of Wilhelm Wundt). Structuralism examined parts of things with the idea that these parts could then be put back together to make wholes (Wikipedia, 2008a). Wertheimer believed that people do not experience life in isolated pieces. The German word for the perception of intact configurations is 'gestalt', accordingly the study of these wholes became known as Gestalt psychology (Skaalid, 1999). Wertheimer, in carrying on his visual research, was influenced by physicists in the late 1800s to early 1900s, such as Faraday, Helmholtz and Hertz. These scientists were studying the phenomenon of electricity, magnetism and gravity. They hypothesized that a type of electromagnetic and gravitational 'field' existed, and that elements within the field are held together by some kind of sympathetic force. These field elements influence each other; they either attract or repel (Zakia, 2002: p.28-29).

Wertheimer argued that physical fields might have their counterpart in visual fields. Gestalt theory supports the argument that the way in which an object is perceived is determined by the total context or field in which it exists, that is, a field process. To

the Gestaltists, a thing is affected by where it is and by what surrounds it, and the whole is different from the sum of its parts (Behrens, 1984: p.49). In figure 2.1 a person can choose to see each visual element (the individual 'A's) separately or as a group that forms an image of a 'C'.

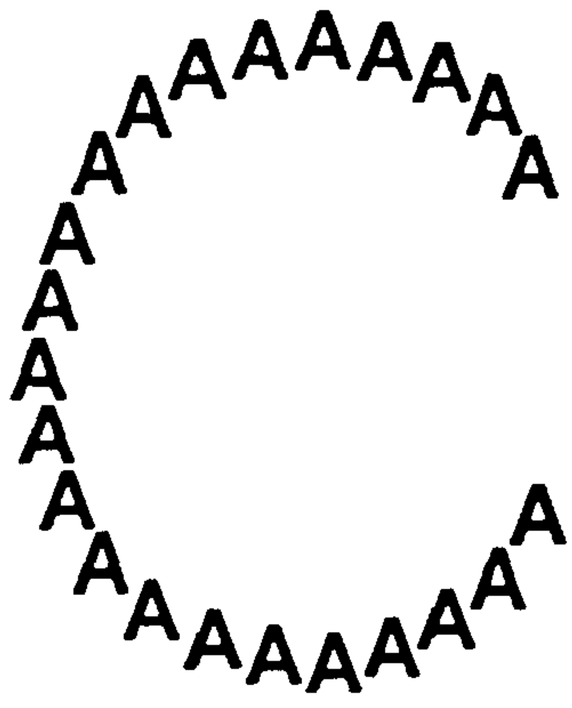


Figure 2.1 An example of Gestalt: the 'C' as a whole is different from the sum of the 'A's.

Seeing the 'C' is seeing the whole of the visual elements. This single figure formed by grouping the visual elements is a Gestalt. To see the 'C' in figure 2.1 or a triangle in figure 2.2 is to see them against backgrounds, which leads us to a discussion of the *figure-ground* relationship (Zakia, 2002: p.28-29).

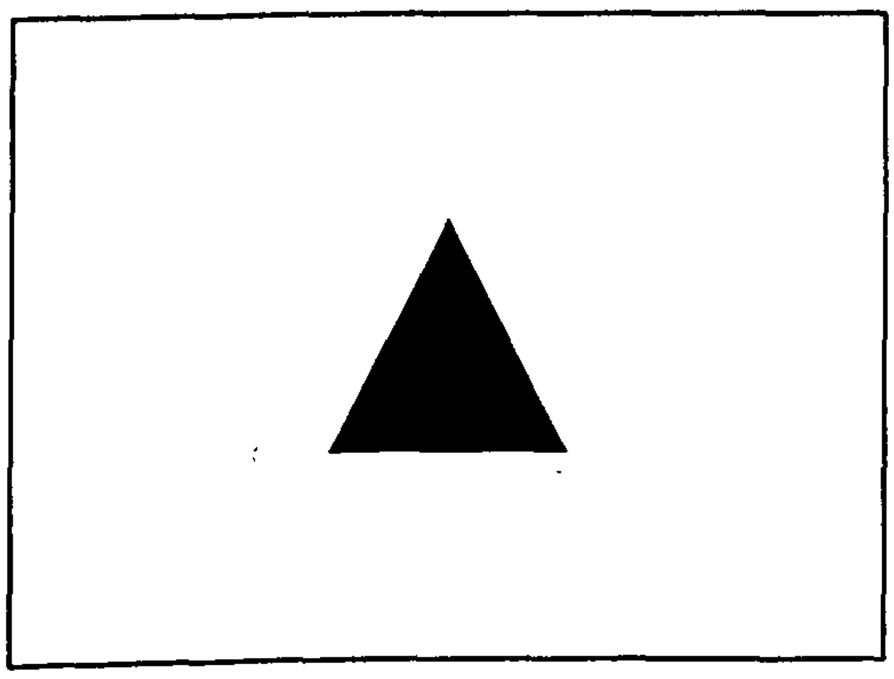


Figure 2.2

2.2 Figure-ground

In perceiving a visual field, the human being tends to see things as a totality against some kind of background. He or she responds to the whole of what is seen, and this whole is composed of the stimuli of which the person is aware, that is, the figure, while the rest of the perceptual field makes up the ground (Korb, 2008). In simple terms, a figure is something that attracts our attention and a ground is everything else that forms the background. In figure 2.3, for example, the 'STOP' as a whole is the figure and the black area is the ground.



Figure 2.3

In view of figures 2.2 and 2.3, several important observations can be made regarding figure-ground relationships:

- the figure often appears nearer to the viewer,
- the figure usually occupies an area smaller than the ground,
- the figure is seen as having a definite form, while the ground is shapeless,
- the figure and the ground cannot be seen at the same time, but can be seen in sequence.

In a heterogeneous visual field, people are free to select what attracts their attention as figure. In a given situation different things will be seen as figure, depending on a variety of circumstances. For example, different people walking down a high street in Manhattan will, at any instant and depending on their interests, see:

- a taxi if they are looking for transportation;
- a LV (Louis Vuitton) store if they are looking for luxury handbags (figure 2.4).



Figure 2.4

In Gestalt theory, the meaning connected with a figure is a critical aspect of its relation to the ground at that particular moment. Whether the viewer notices the taxi or the LV store is related meaningfully to the basis of the viewer's experience which is a rich mixture of all of the past experiences of the self, the environment, and their numerous interactions plus the feelings, beliefs, values and the expectations that are embedded in the mind. "The ground defines the figure and gives it meaning" (Korb, 2008).

The notion of figure-ground has been widely applied to the design of graphic symbols or company logos. Figure 2.5 is an example of an effective use of figure–ground. Initially one might see 4 strange black arrowheads pointing in four directions, and perhaps within a few seconds notice a large letter M in the white area. Once the 'M' is seen as figure it can alternate with the black arrows and be seen as figure or as ground. Both, however, cannot be seen as figure at the same time. "Figure needs a ground area from which to emerge" (Zakia, 2002: p.5-6).

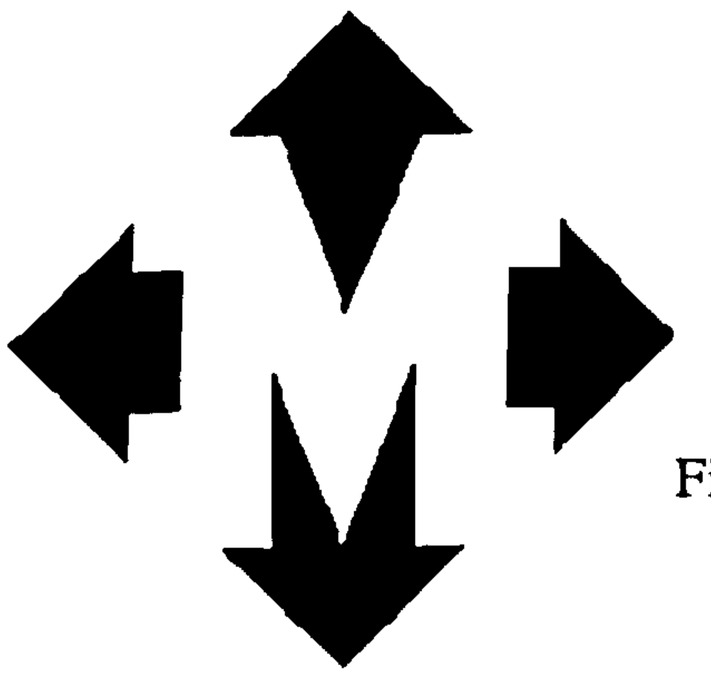


Figure 2.5 If you decide that the black areas are figure, you see 4 arrows. If you decide that the white area contained within the black area is figure, you see a big 'M' (Zakia, 2002: p.6).

It should be noted that the figure-ground perception is most often exemplified using the Rubin Face/Vase Illusion, named after the Danish psychologist Edgar Rubin (Rubin, 1915; figure 2.6). He is credited with popularizing the issue of figure-ground organization and it is therefore often associated with Gestalt psychology more broadly. However, some scholars, such as David Carrier, may not share this view. In a reply to Roy R. Behrens's article "Comments on Arnheim and Carrier", he wrote:

"That we make figure-ground distinctions and the other discriminations ... is a fact known long before the creation of Gestalt psychology; how to explain this capacity is an issue worth study" (Carrier, 1987: p.210).

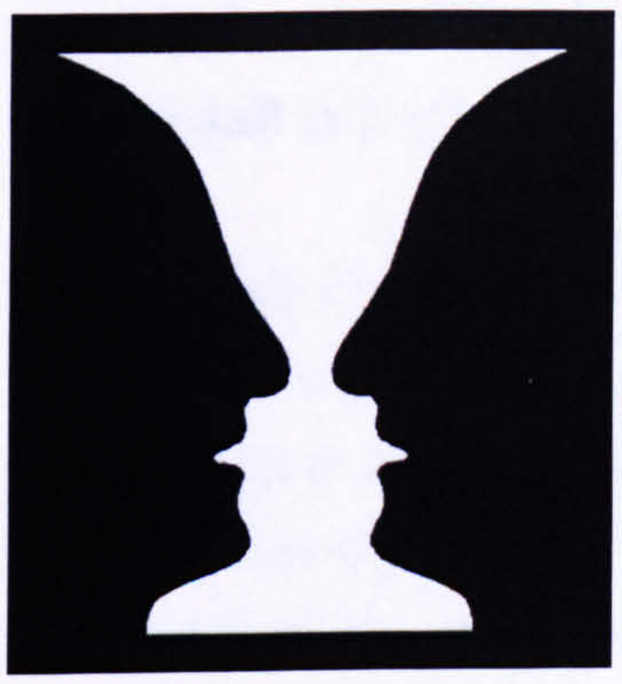


Figure 2.6

Carrier provided no justification for his claim that figure-ground perception did not originate in Gestalt psychology. Artists might have been aware to some extent of this effect and used it in subtle ways, but they quite often failed to give an accurate explanation for it. An example of the ingenious use of this phenomenon can be seen in a picture by a French artist, painted 140 years before the Rubin vase drawing first appeared (figure 2.7; Zakia, 2002: p.1).



Figure 2.7 L'URNE MYSTÉRIEUSE
–Pierre Crussaire, 1774

2.3 Gestalt principles of perceptual organization

The Gestalt concept emphasizes that we perceive objects as well-organized patterns rather than separate component parts. According to this concept, when we open our eyes we tend not to see isolated components in disorder. Instead, we notice wholes with defined shapes and patterns. The whole that we see is something that is more structured and cohesive than a group of separate parts (Pedroza, 2004).

The aim of Gestalt psychologists is to investigate the global and holistic processes involved in perceiving structure in the environment (Sternberg, 1996). More specifically, they try to explain human perception of groups of objects and how we perceive *parts* of objects and form *wholes* (Soegaard, 2008). The investigations in this subject crystallised into the *gestalt laws of perceptual organization*. In this section, we shall concern ourselves with only four basic principles, that is, the laws of proximity, similarity, continuation and closure. These principles are first presented in a simple and coherent way (figure 2.8).

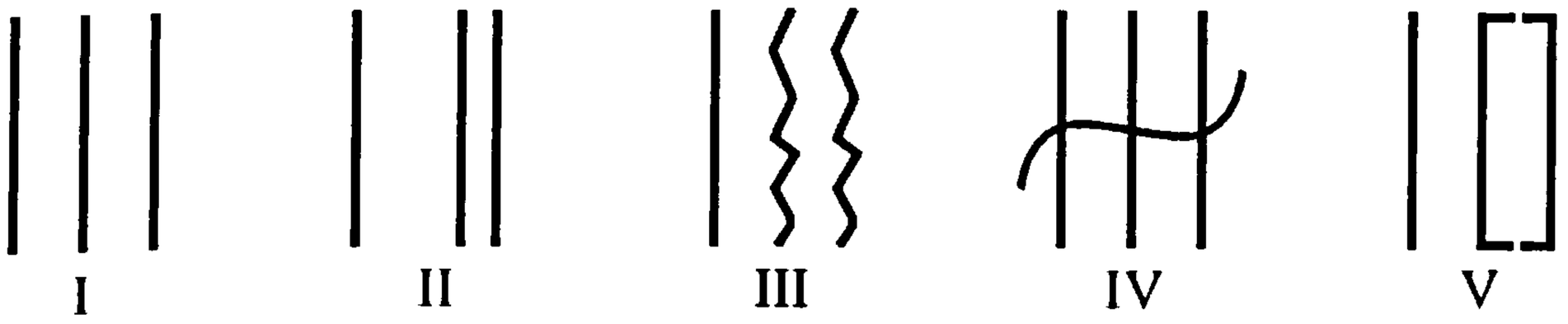


Figure 2.8

I. The spacing between the 3 lines is the same; they can be seen as 3 separate lines.

II. Proximity: All 3 lines are similar, but the 2 to the right are in close proximity and therefore seen as belonging to a group.

III. Similarity: the two zigzag lines to the right are similar and seen as belonging together.

IV. Continuation: the curved line passes the 3 vertical lines visually uninterrupted and is seen as a continuous whole.

V. Closure: the short tips on the 2 lines to the right facilitate the grouping of these lines to form closure (Modified from Zakia, 1993: p.71).

Photographic applications of these principles are often found in the work of the students and well-known photographers, and they are described in detail in the subsequent subsections.

2.3.1 Proximity and similarity

The photograph of 3 persons burning joss sticks by a previous student, titled *Burning*, is a good example of proximity and similarity (figure 2.9). In figure 2.9, all 3 arms are close together, and the intervals between them are similar. In addition, the posture and shapes of the arms are quite similar, as are the shape and spacing of the joss sticks and the angles at which they are held. Similarity and proximity of visual elements facilitate grouping. One may notice that the 2 arms on the left have smooth skin, while the one to the right is dry and winkled. Furthermore, only the 2 arms on the right wear sleeves, which are of different sizes and colors. This play of dissimilarity against similarity, along with the burning of the joss sticks, makes an expressive and effective composition that gives this photograph its meaning, that is, people of different ages, genders and professions have the same pious belief in Matsu (Goddess of the Sea)[2].



Figure 2.9

Another interesting example of similarity is figure 2.10, in which a kind of visual communication seems to exist between the girl and the graffiti. The contours of the two are alike, as are their postures. The student has been careful to show them facing each other. Once again it is the play of similarity against dissimilarity, such as sizes, colors and certainly orientations, that makes an interesting composition that could be found in the works of other renowned photographers.

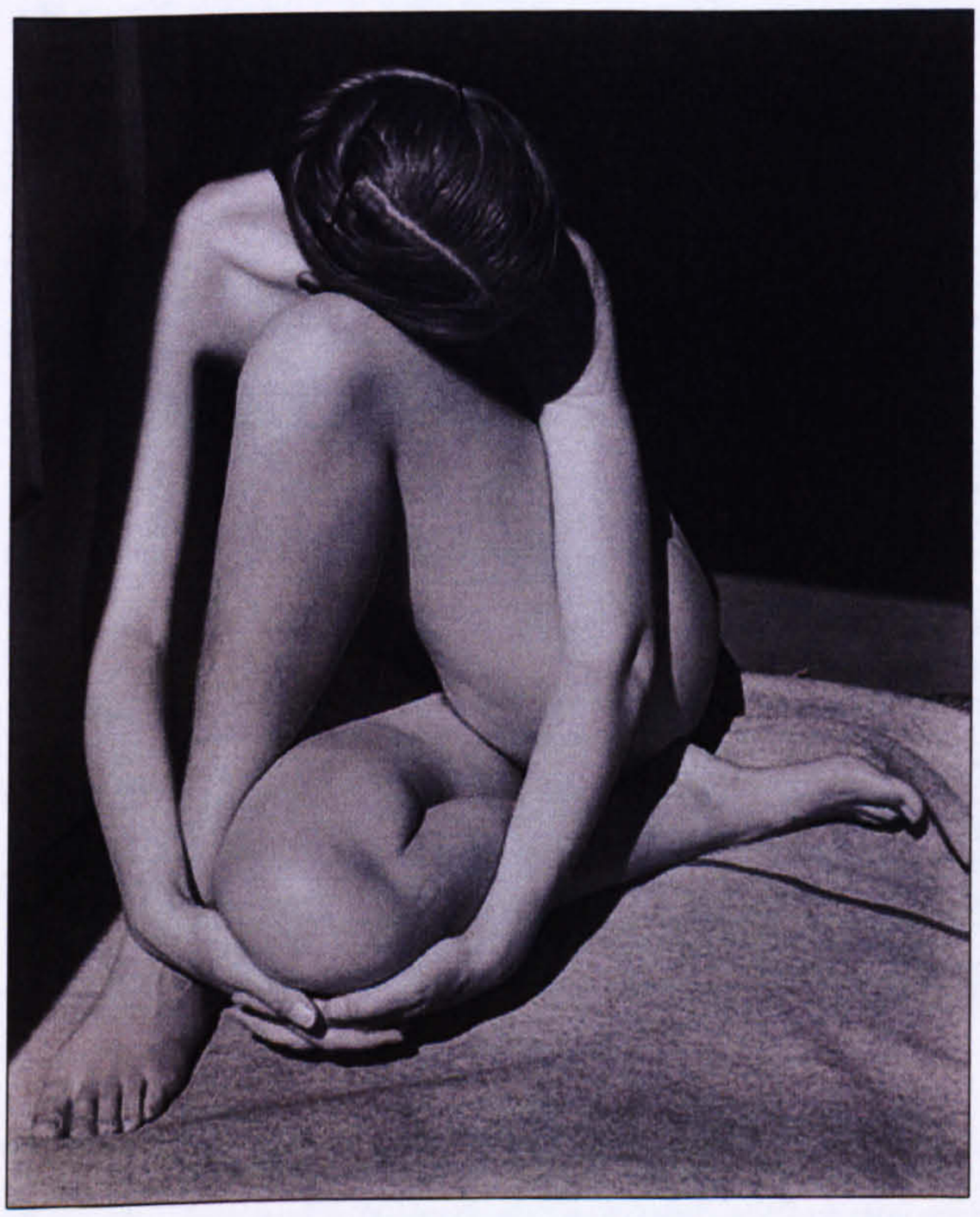
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[2] **Matsu**, Goddess of the Sea, worshiped by most fishermen in Taiwan.



Figure 2.10

2.3.2 Continuation



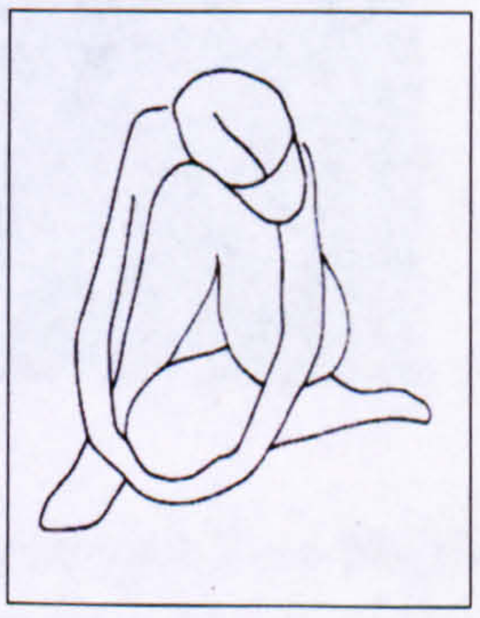


Figure 2.11 Nude, 1936 —Edward Weston

A photograph that serves as a classic example of the importance of continuation is Edward Weston's "Nude, 1936" (figure 2.11). This, according to his son Cole, was his favorite photograph. If we trace the contours of the woman's body, a beautifully flowing and continuous image will emerge. We should notice how the head has been

carefully positioned in such a way that the parted hairline can be seen as a continuation of the contour of her left arm (Zakia, 2002: p.49). It is a beautiful study in form and shadow. The emphasis is on the aesthetic appeal rather than the woman's appearance.

2.3.3 Closure

The squirrel photograph of figure 2.12 is an ideal way to illustrate the significance of closure in the visual design of a photograph[3]. The squirrel is positioned in the tree hole in such a way that the viewer is invited to complete the partially covered head and front leg to form a whole, through which closure is achieved. Closure provides an opportunity for viewer participation. It allows the viewer to complete the contours of the animal, and this completeness or closure makes an amusing composition that gives meaning to this picture: the squirrel is eagerly searching for something in the tree hole. Human beings derive satisfaction from being able to form a closure that allows them to become active participants in the visual experience.



Figure 2.12

It is important to note that while Gestalt psychologists call these phenomena 'laws', they are *laws of perceptual organization* rather than *laws of artistic creation*, in that they do not impose limitations on our behaviour[4]. Therefore, a more appropriate term would be *principles* as used in this section.

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[3] This untitled photograph was made by a research participant.

[4] The researcher has seen vehement attempts to violate these laws with the thoughts that "I don't have to follow blindly what others tell me to do" or "these laws are too *mechanical*". These students (their names are kept anonymous) have not fully grasped why and where these principles come from.

The Gestalt principles have been separated in this section for convenience in presentation and comprehension. However, we must not think of them as separate, for they appear to influence each other and work together to facilitate seeing. The proximity, similarity, continuation and closure of visual elements are important to facilitate the perception of the common belief, visual dialogue, flowing contour, and squirrel searching for food (see figure 2.9 – 2.12) as a human being always seeks to establish a visual equilibrium, more precisely, a visual balance in the process of perception, which is the major concern of the following section.

2.4 Visual balance

Underlying Arnheim's enterprise is an intuitive approach to nature that the Gestalt psychologists share to a certain degree but only Arnheim fully acknowledges. Their intuition is that, while the world has material and life and spirit, each domain has a parallel form to the other. Specifically, they believe that outer physical world and inner mental world are isomorphic with each other. This intuition of isomorphism is the primary idea that permits Arnheim to expand Gestalt horizon towards the furthest reaches of visual experience. As he renewed Gestalt 'fields of force', 'vision of simplicity' and 'visual dynamics', so he renewed visual perception as a field of psychological and phenomenological study (Kennedy, 1980). These issues are further discussed in the present section and sections 2.5 and 2.6 respectively.

Arnheim used a simple figure made up of a dark disk on a white square for an initial demonstration of the dynamic process of perception (1974: p.10-18; see figure 2.13).

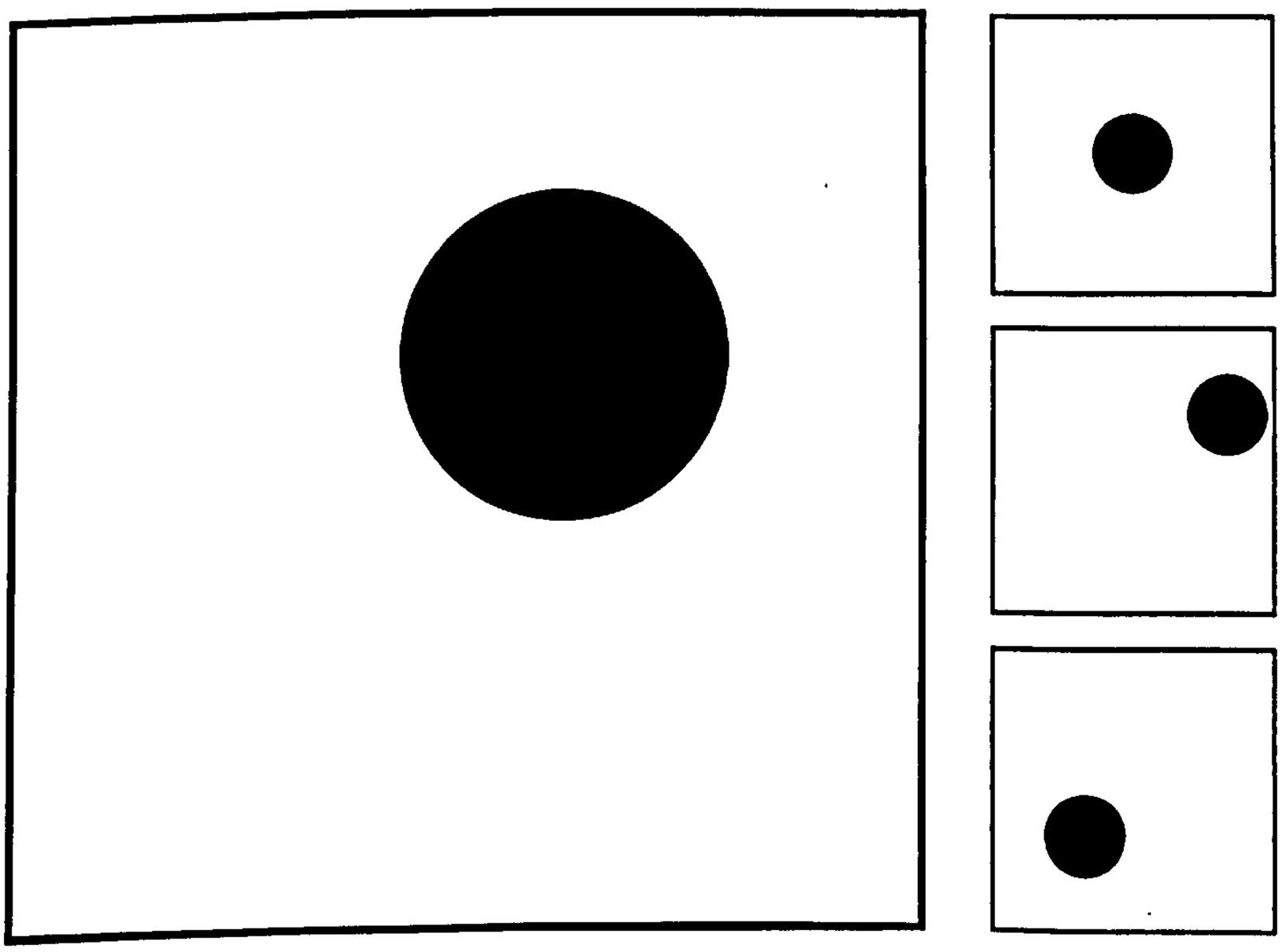


Figure 2.13

Placing the disk in different positions on the white square makes it obvious that the figure creates a certain psychological tension depending on where the disk is placed. For example, when the disk is placed off-center, it appears as if there is something restless about it. It looks as though it came from the center and now wishes to return, or as though it wants to move away even farther. In other positions it looks solidly at rest (e.g. the center point). Sometimes it may be unclear in what direction the pulls or pushes are going, but the display is usually filled with tension and this tension seems to be generally directed towards a higher degree of balance or in certain cases away from balance. Arnheim argues that what a person perceives is not only an arrangement of objects, of shapes and colors, of movements and sizes. It is, according to him, an interplay of these directed tensions. These tensions, he adds, are not physically embedded in the paint or canvas or added by the observer from experience or knowledge. Rather, these tensions are as inherent in any percept as size, shape, color and location, that is, they are genuine properties of the perceived pattern. Since they have magnitude and direction, these tensions can be described as *psychological forces* or *visual forces* (1974: p.11 & p.412).

Arnheim argues that artists should strive for balance in their work so as to make artistic expression unambiguous. But why should artists strive for balance? Why is pictorial balance indispensable to artistic statements? In response to these questions, Arnheim states:

"In a balanced composition all such factors as shape, direction, and location are mutually determined in such a way that no change seems possible, and the whole assumes the character of 'necessity' in all its parts. An unbalanced composition looks accidental, transitory, and therefore invalid. Its elements show a tendency to change place or shape in order to reach a state that better accords with the total structure. ... Since the configuration calls for change, the stillness of the work becomes a handicap. Timelessness gives way to the frustrating sensation of arrested time" (1974: p.20-21).

Arnheim believes that under conditions of imbalance, the ambiguous pattern allows no decision on which of the possible configurations is meant and therefore the artistic statement becomes incomprehensible. Thus far the answer to why pictorial balance is necessary has been that by stabilizing the interrelations between the various forces in a visual system, the artist avoids such instability and makes one's expression unambiguous (ibid, p.36). An amusing example shows how the concept of balance can be used in explaining why an anonymous fifteen century painter placed a large dark patch on the angel's robe to provide visual balance to match the balance

portrayed in *St. Michael Weighing Souls* (see figure 2.14; ibid, p.21).

In figure 2.14, by the mere strength of prayer, one pious little soul outweighs 4 big devils plus 2 millstones. Unfortunately, "... prayer carries only spiritual weight and provides no visual pull" (Arnheim, 1974: p.20). As a remedy, the artist has added a large dark patch on the angel's robe just below the scale that holds the saintly soul (see figure 2.15, the patch is placed just below the left pan of the scale). The patch helps to pull one of the pans of the scale downward to adapt the appearance of the scene to its meaning.



Figure 2.14 St. Michael Weighing Souls (digitally modified).

This explanation defines not only the function of the dark patch within the configuration of visual forces that make up the painting, it also signifies its symbolic meaning. As to why the dark patch exerts attraction, Arnheim believes that the answer is: because all visual objects do. This explanation inevitably raises a fundamental question about the nature of Gestalt principles, that is, they are descriptive in essence rather than explanatory (Arnheim, 1981: p.222; Wikipedia, 2008b).



Figure 2.15 St. Michael Weighing Souls.

Arnheim argues that although this reference to a perceptual rule provides an explanation, rules in themselves are all descriptive and indeed not explanatory. They state, for example, that vertical shapes look longer than horizontal ones; or that objects in close proximity are group together. If we wish to know why this is so, according to Arnheim, we must ascend to the next higher level, namely the physiological counterparts of the perceptual phenomenon. He then adds: "Granted that what is known now about the functioning of the nervous system does not suffice to give us the explanation we are looking for; but in my opinion neurophysiology is the only area of research that will ever be able to provide them" (1981: p.222). Similar sentiments were also expressed by other Gestalt psychologists (e.g. Verstegen, 2005: p.39 – 41).

In short, artists strive for balance so as to make their statements unambiguous. Going a step further, Arnheim adds that human beings strive for equilibrium in all phases of their lives, and that the same tendency can be observed not only in all living organisms, but also in physical systems. Arnheim quotes the principle of entropy (the Second Law of Thermodynamics[5]) to assert that:

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[5] The Second Law of Thermodynamics states that in an isolated system, each successive state represents an irreversible decrease of active energy and increase in entropy.

"The universe tends toward a state of equilibrium in which all existing asymmetries of distribution will be eliminated, and the same holds true for narrower systems [e.g. human beings and animals] if they are sufficiently independent of external influences" (1974: p.36).

The tendency toward balance is a general law active in the physical world and reflected in perceptual experience. Artistic activity can be seen as a component of natural activity, and as such artists and consumers will participate in the striving for balance. This is the idea of Gestalt isomorphism, in which mental processes are thought to be isomorphic to physical processes. However, Arnheim reminds us that the quest for balance is not sufficient to describe the controlling tendencies in human motivation generally or in art particularly. We may end up with an image that the human organism resembles a stagnant pond, "stimulated to activity only when a pebble disturbs the balanced peace of its surface and limiting its activity to the reestablishment of that peace" (ibid, p.36-37).

But is this true? Arnheim argues that the main characteristic of the living organism may well be that it represents an anomaly of nature in waging a persistent fight against the universal law of entropy by drawing new energy from its surroundings. Only by looking at the interplay between the energetic life force and the tendency toward balance can we reach a fuller conception of the dynamic process of visual perception (1974, p.36-37).

In view of the tendency toward balance in artistic activity, Binkley argues that we should also think that amusement parks and art galleries prove that artists strive as well for imbalance, variety and challenge, and sometimes they intentionally seek out ambiguity. The fact that a work of art is ambiguous is not good or bad by itself, but that it all depends on what the artist is up to (1986, p.361 - 364).

Arnheim's responses to the pursuit of imbalance are first, in rare instances, this is precisely the effect the artist intends; second, it may be that the tendency toward balance or simplicity is counteracted by the abovementioned *energetic life force* or in Arnheim's words, "tension-heightening strivings" (1974, p.411), which are addressed in sections 2.5 and 2.6.

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represents an irreversible decrease of active energy and increase in entropy.

2.5 Simplicity

When we look at a simple figure, such as figure 2.16, why do we tend to see the 4 dots as a square like figure 2.17A, but hardly as a leaning diamond or a profile fish (figure 2.17B, C), even though the latter shapes contain the 4 dots as well? White circles, or for some observers, squares appear in the centers of the crosses shown in figure 2.18, even though there is no trace of a circular or square-shaped contour[6].

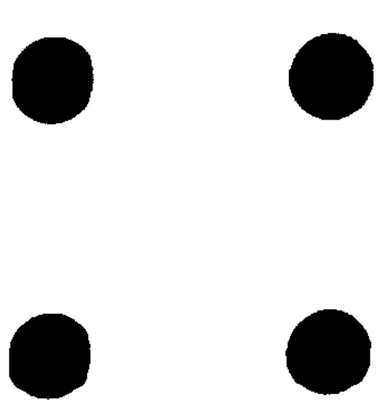


Figure 2.16

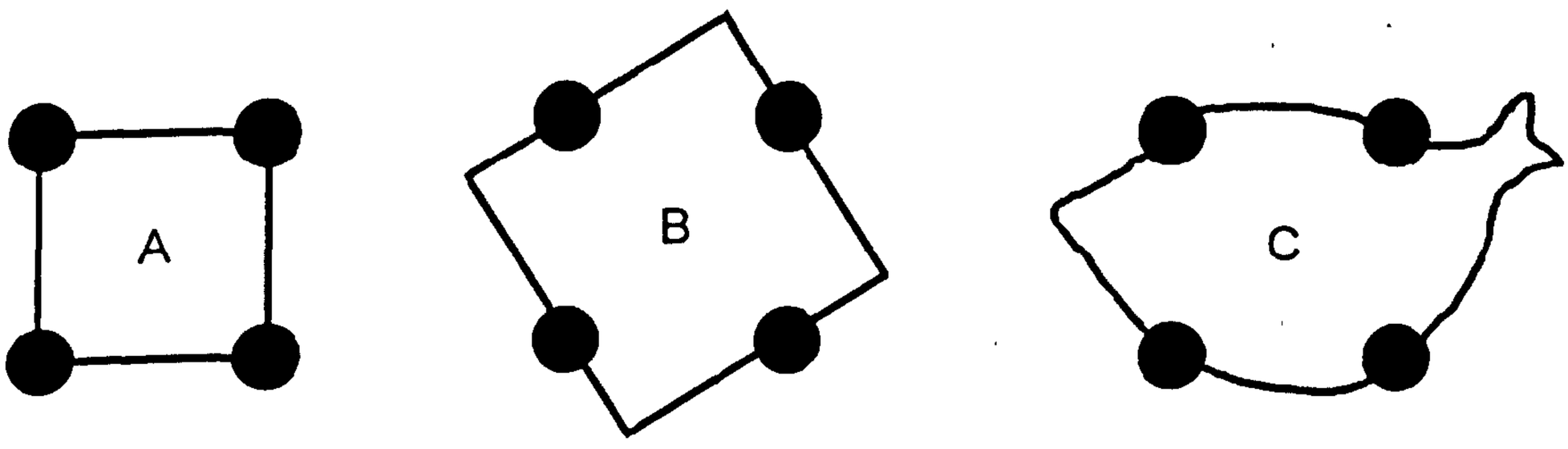


Figure 2.17

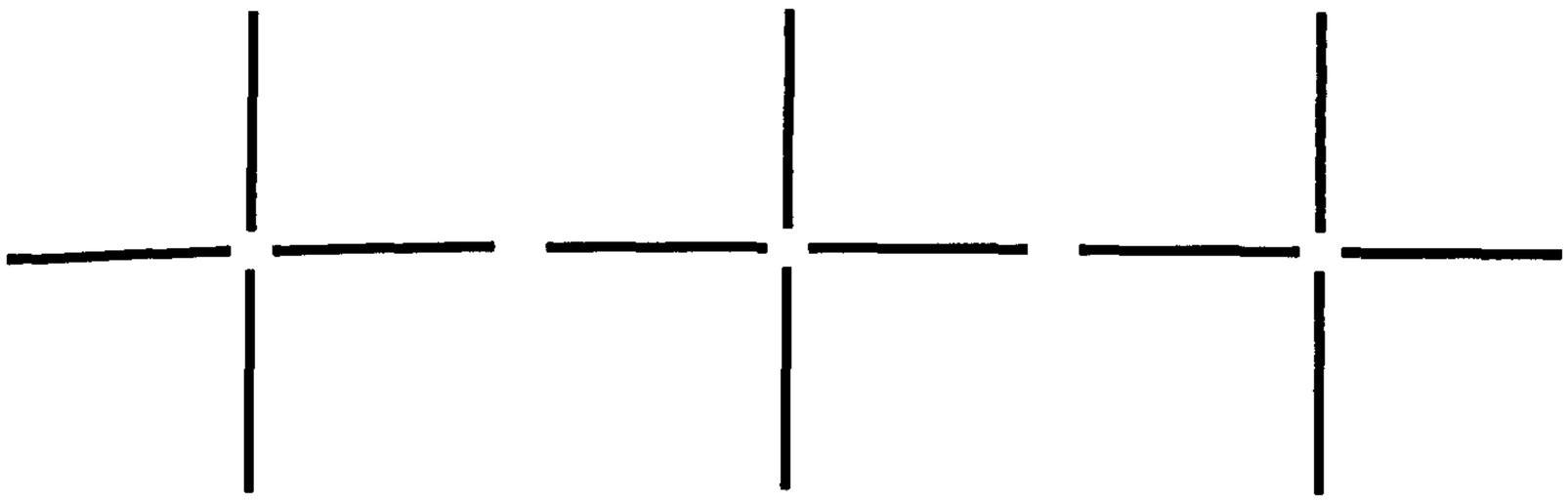


Figure 2.18

Phenomena of this kind find their explanation in what Arnheim and other Gestalt psychologists describe as the basic law of visual perception, that is, the law of simplicity. It states:

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[6] In an informal survey (conducted by the researcher) of 58 students around 70% saw circles in the centers of the crosses, while the remaining 30% saw squares.

"Any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the *given conditions* permit" (Arnheim, 1974: p.53).

Arnheim asserts that the tendency toward simplest structure is the most fundamental of Gestalt principles. Simplicity in the perceptual sense refers to visible structure. He argues that the simplicity of a pattern can be defined by its structural features, and such features, as far as shape is concerned, can be described by distance and angle. Those of a square, for instance, are the length of the edge, the right angle and the symmetrical arrangement. As a visual phenomenon, the square possesses properties not found in a physical object of the same shape in mathematics or in carpentry. Its 4 lines create a field of forces, and these forces in turn are seen as holding the shape together. Arnheim reminds us that this is where simplicity connects with visual tension (1974: p.53 – 57; Beardsley & Arnheim, 1981: p.220 – 223).

Perceptual simplicity, according to Arnheim, is a structural trait of configurations of forces. Any such configuration has a degree of tension, which can be seen as a 'symptom', just as fever is a symptom of cold. The simpler the pattern, the lower the tension it conveys as an indivisible aspect of the perceptual experience. It can be said that there is less tension in a circle or more tension in a rectangle than in a square. Therefore, tension reduction is a symptom of the tendency toward simplest structure. It can be used to tell and perhaps to measure the degree of simplicity in a system, as a thermometer indicates the intensity of an infection (Beardsley & Arnheim, 1981: p.222).

But why is the tendency toward simplification limited by the "given conditions"? Arnheim's response is that any interaction of forces takes place in a field and is limited by the constraints inherent in that field. The shape of a visual pattern is unchangeable and fixed to its place as long as the retinal projection lasts. The immobile shape is the constraint that confines the activities of forces in their striving toward simplest structure. In the example of figure 2.13, the black, off-center disk in a white square cannot move and therefore cannot give in to the pull toward the center, which would create symmetry, reduce tension, and increase simplicity, suggesting *a balanced status of active forces* (ibid)[7]. The immobility of the disk is therefore a limitation. Arnheim calls it the decisive 'limiting condition', which does not, however, *explain* the striving toward simplifying balance.

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[7] Obviously, the balance of visual forces is the ultimate, or more precisely, 'ideal' state of the tendency toward simplicity.

Arnheim points out that it is necessary to refer to a fundamental insufficiency from which the presentations of Gestalt theory seem to have suffered from the very beginning. The shapes that constitute the visual world cannot be generated by the tendency toward simple structure alone. That tendency explains why shapes organize in certain ways, but it does not tell why they exist in the first place. If the tendency toward simplicity had its way unopposed, it would create nothing better than a homogeneous field like lumps of salt dissolved in water. Gestalt theory, according to Arnheim, must provide for a countertendency, equal in rank to the one promoting simplest structure, a tendency that articulates shapes, which is the major topic of the following section (1974, Chapter 9; ibid).

2.6 Visual dynamics: simplicity is not enough

If simplicity were the one overriding goal of art, canvases with evenly distributed patterns would be the most desirable art objects. The description of any visual objects remains rather incomplete if it limits itself to indicating that everything fits nicely together. Although the analysis of balance and unity is indispensable, it avoids the question without which any visual statement remains incomprehensible: "What is it that being balanced and unified?" Arnheim asks this question and argues that it can not be answered by reference to subject matter alone. Instead, if refers to the form we see.

In the physical world, the tendency toward simplicity rules unopposed only in closed systems (2nd Law of Thermodynamics). When no new energy can enter,

"the forces constituting the system rearrange themselves until equilibrium [balance] is reached and no further change is possible. This final state demonstrates itself visually by exhibiting the simplest shape available under the circumstances" (Arnheim, 1974: p.411).

The human being, however, is not at all a closed system. Physically, it acts against the running-down of usable energy within itself by continually absorbing energy from its environment. Psychologically, likewise, the living organism replenishes its fuel for action by absorbing information through the senses and processing it internally. Brain and mind strive for growth, invite change and adventure. At the same time,

"the tendency toward simplicity is constantly at work. It creates the most harmonious and unified organization available for the given constellation of forces, thereby ensuring the best possible functioning both within the mind and body and in their relation to the social and physical environment" (ibid).

Arnheim envisages the human mind as an interplay of tension-reducing and *tension-heightening strivings*. The tendency toward tension-reduction is antagonized by what Arnheim has called the constructive or 'anabolic' tendency, the creation of a structural theme.

If the tendency toward simplest structures would rule unopposed, the result would be a homogeneous field which leaves us with nothing to look at, because every particular input would dissolve like sugar crystals in water. Instead, as the eye is directed toward an object, the retinal projection of that object imposes itself on the field of vision as a constraint and furthermore, a structural theme, this tendency provides us with something to see. There is no conflict between tension-reducing and tension-heightening tendencies. Arnheim argues that the world of tension-increasing stimuli, the carrier of environmental information, is subjected to the shaping efforts of the balancing force, which simplifies and clarifies the incoming raw material. To avoid misunderstanding, he further adds:

"It seems essential to notice here, however, that the input of externally generated stimuli is more than a set of constraints limiting the activity of an exclusive organizing tendency toward simplest structure. The very absorption of exogenous stimuli is a manifestation of the articulating counterforce, which in interaction with its antagonist constitutes perceptual organization" (Arnheim, 1992: p.212 – 213).

Both antagonistic tendencies constituting the Gestalt process make the stimulus more clear-cut, more unambiguous. One of them increases symmetry and regularity and eliminates distracting, unessential details from the stimulus, involving a reduction of the tension inherent in the visual pattern; the other intensifies its characteristic features, and therefore increases that tension. If the stimulus is weak, e.g. dimly illuminated or exposed for only a split second, the forces inherent in the visual field will organize or even modify it to give it the simplest possible structure. Once again, an interplay between tension-heightening and tension-reducing tendencies is at work. The result of this highly dynamic process is the visual object as we see it (Arnheim, 1974: p.411 – 412).

2.7 Gestalt psychology and art

In the most general sense, psychology claims to have a contribution to the understanding of art and art history because anything relating to the mind is in psychology's domain. The creation and reception of artistic experience surely belong to this discipline. Psychology can be considered as indispensable for dealing with art for "no theoretical statement on matters of the mind, put forth by experts of laypersons, can be better than the psychology on which it is based" (Arnheim, 1992: p.115).

More specifically, from its beginnings Gestalt psychology had a kinship with art. Art prevails in the writings of the co-founders of this school, i.e. Max Wertheimer, Wolfgang Köhler, and Kurt Koffka. Gestalt psychologists argue that an artistic vision of nature was needed to remind scientists that most natural phenomena are not described and perceived adequately if they are analyzed piece by piece. That a whole cannot be attained by the aggregation of separated parts was not something new to artists. Scientists may well have been able to say useful things about the world by describing networks of mechanical relations, but at no time could a work of art be fully appreciated by a mind unable to perceive the integrated structure of a whole (Arnheim, 1974: p.4 – 5).

Although the principles of Gestalt psychology are descriptive rather explanatory in nature, Gestalt theory has been continually used to interpret and analyze modern art, in particular the work of Jackson Pollock (Kobbert, 1989: p.205 – 218). Gestalt grouping is an alternative source of explaining how infants and children achieve perceptual organization (Quinn & Bhatt, 2006: p.1221 – 1230). A number of researchers such as Adelbert Ames at Dartmouth College and Hoyt Sherman at Ohio State University considered Gestalt principles of perceptual phenomena as a model of art instruction (McWhinnie, 1992: p.1233 – 1234). Gestalt principles have also been used in the literary analysis of poetry, and specifically in attempts to understand how readers comprehend metaphors (Tsur, Glicksohn & Goodblatt, 1991: p.487 – 500).

Arnheim offers a revealing example of how Gestalt theory is applied to particular works of art. In his analysis of Cézanne's portrait of his wife in a yellow chair (figure 2.19), Arnheim argues that the composition of a picture in art may be complex, having a structure of many unequal and seemingly contradictory perceptual forces, but they all contribute to a dynamic whole. The meaning of the picture emerges from the interplay of activating and balancing forces (1974, p.37 – 41).



Figure 2.19 Madame Cézanne in a Yellow Chair – Paul Cézanne

Cézanne's portrait was painted in 1888 to 1890. Arnheim describes this painting as below:

"What soon strikes the observer is the combination of external tranquility and strong potential activity. The reposing figure is charged with energy, which presses in the direction of her glance. The figure is stable and rooted, but at the same time as light as though it were suspended in space. It rises, yet it rests in itself. This subtle blend of serenity and vigor, of firmness and disembodied freedom, may be described as the particular configuration of forces representing the theme of the work. How is the effect achieved?" (1974, p. 37 – 38).

In his own answer to this question Arnheim draws attention to the picture's upright format, which stretches the portrait in a vertical direction and reinforces the upright character of the figure, the chair, and the head. The dark band on the wall divides the background into two horizontal rectangles, counteracting the vertical stress made by the frame. These two rectangles also enhance an upward movement of the whole by the fact that vertically the lower rectangle is taller than the upper. Here, Arnheim refers to Denman Ross's (1933, p.26) study which states that *the eye moves in the direction of diminishing intervals*, that is, in this painting, upward (1974, p.37 – 41).

The increasing 'slimness' from the frame to the chair and from the chair to the figure creates a movement from the background over the chair to the foreground figure (figure 2.20). Correspondingly, a scale of increasing brightness leads from the dark band on the wall by way of chair and figure to the light face and hands, the two focal points of the composition. At the same time the shoulders and arms form an oval around the middle section of the picture, a centric core of stability that counteracts the pattern of rectangles. This is repeated on a smaller scale by the head (ibid).

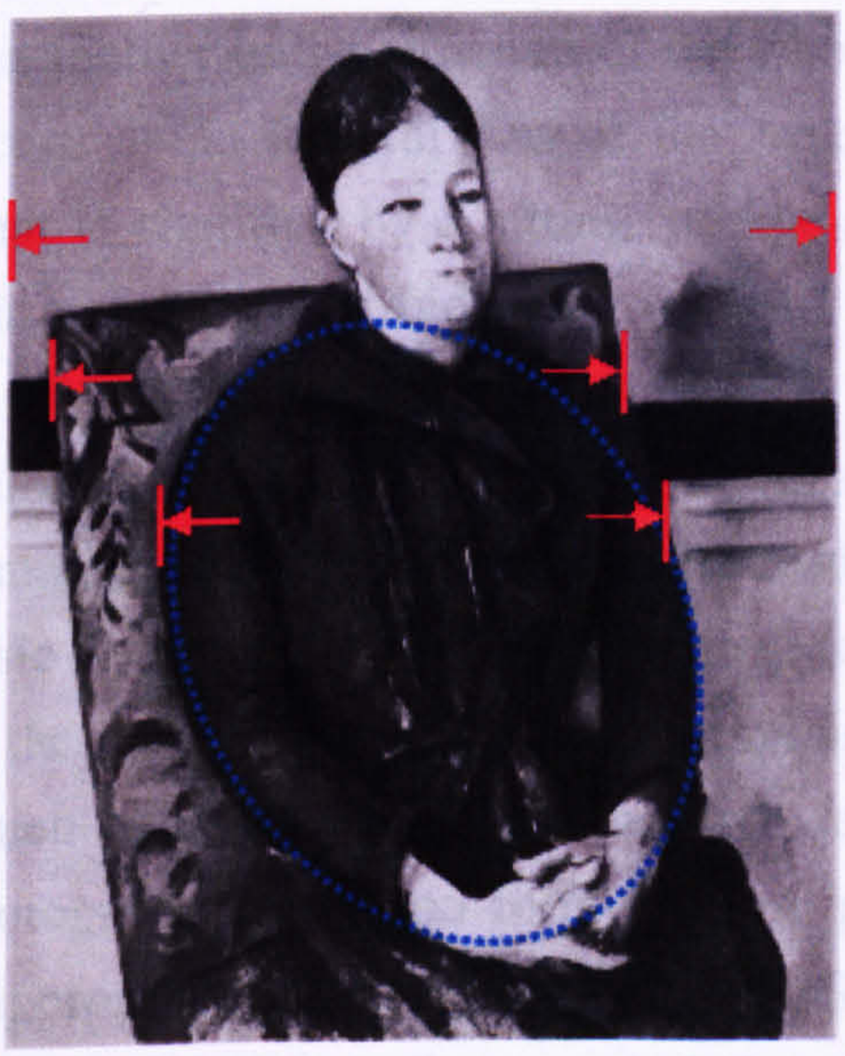


Figure 2.20

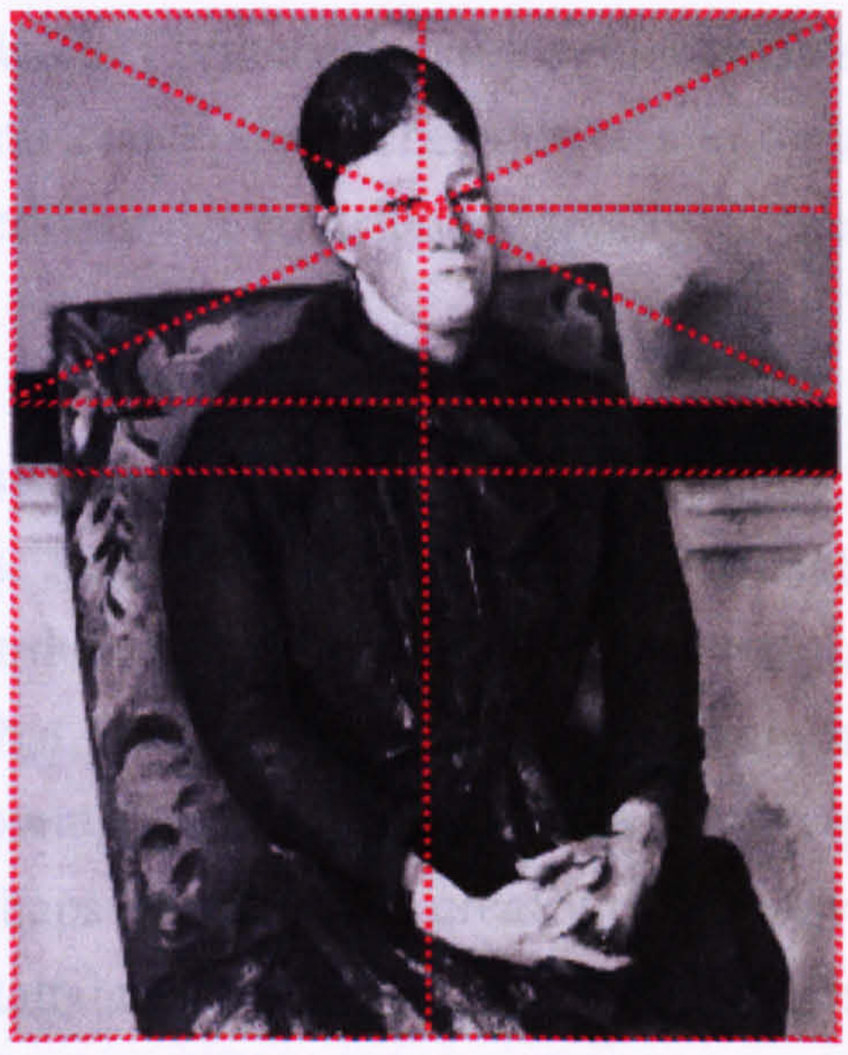


Figure 2.21

Arnheim states that the three main planes of the picture, the wall and chair and figure, overlap in a movement going from far left to the near right. This dominant rightward movement is reinforced by the asymmetrical placement of the figure in relation to the chair: the figure presses forward by sitting mainly on the right half of the chair. It is also emphasized by the asymmetrical figure with the left side slightly wider than the right. On the other hand, this lateral movement toward the right is counteracted by the chair, which lies mainly in the left half of the picture and tilts toward the left.

The head is firmly anchored in the central vertical axis and also the center of the upper rectangle (see figure 2.21)[8], although at rest the watchful eyes contain a directed tension. The hands, the other focus of the composition, are thrust slightly forward in an attitude of potential activity, but this activity is neutralized by their interlocked position.

Arnheim's analysis not only hints at the wealth of dynamic relations in the work, it will also suggest how these relations establish the particular balance of rest and activity that characterizes the theme or content of the picture. He points out that realizing how this pattern of visual forces reflects the content is helpful in trying to appraise the artistic excellence of the painting (1974, p.41).

Resting this composition on point and counterpoint does not create ambiguity. Ambiguity leaves the observer hovering between two or more assertions that do not make a whole. According to Arnheim, each set of the antagonistic forces is in hierarchical relation with one another, in that there exists a dominant force against a subservient one. Although each relation may be imbalanced in itself, they compensate one another in the structure of the whole work. Furthermore, the subject matter of the picture is an integral part of the structural conception. The viewer's knowledge of what is signified by a sitting, middle-aged woman contributes greatly to the deeper sense of the work (ibid).

Before going on to discussing the next section on Gestalt and photography, a brief summary might be useful for the readers. Some learners and educators confuse the basic four Gestalt principles[9] with Gestalt theory, whereas the former is only a subset of the latter. They sometimes complain that Gestalt theory is too 'mechanical'[10], by which they actually mean following these principles to produce photographs seems too formulaic and perhaps would stifle creativity. However, it is inappropriate to interpret or follow Gestalt laws too rigidly or blindly, in that the results might be a coherent whole but without meaning. It is Arnheim who once said: "The people who are controlled by principles do not create anything" (Kleinman & Van Duzer, 1997: p.126). On the contrary, one must be able to apply the concept skillfully and flexibly. Readers are referred to figure 2.9 for a very good example.

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[8] The center, according to Arnheim, is the most stable position in a picture frame (usually a rectangle), because it is the principle locus of attraction and repulsion, establishing itself through the crossing of central vertical and horizontal axes and the diagonals. He adds, any location that coincides with the four structural lines or the intersections of these lines and edges introduces an element of stability (1974, p.13 – 14).

[9] The law of proximity, similarity, continuation and closure.

[10] This can be seen in the learning diaries or informal talks.

2.8 Gestalt and photography

The fact that Gestalt theory is applicable to art inevitably leads to the question of whether it is also applicable to photography. It appears to the author that this issue can be addressed by asking: Is photography an art form? It seems that in the literature most discussion as to whether photography is or is not an art has been and continues to be conducted on an inappropriate basis. To either prove or disprove this issue, the debaters entered upon long definitions or descriptions of painting, portraiture, drawing etc in order to find resemblances and differences between these arts and photography (e.g. Berger in Trachtenberg, 1980: p. 291-294; Arnheim, 1986: p.102-114[11]; Lyas, 1997: p.45-49). However, this process of reasoning is fallacious, for the question asked is not, "Is photography a graphic art?" but is, "Is photography an art form?"

To verify the claim that photography is one of the fine arts, we need to find out if photography possesses the characteristic(s) essential to all arts. An anonymous author (Trachtenberg, 1980: p.133-140) argues that there is one quality which all arts must posses, that is, the personal touch, and the true meaning of it is composing. The painter, the musician and the sculptor all compose to give order to their work, and when this order is perceived we are pleased. Now we are turning to the question of whether a photograph can be a composition, and whether photography is capable of order. In an example concerning landscape photography provided by the above-mentioned writer, he states that landscapes can not be easily composed and that order is to be found in nature. But he adds that nature does compose, which is proved by the fact that straightforward photographs of her have been made fulfilling all the requirements of perfect composition. The photographer can then 'transfix' nature's compositions to his or her pictures (ibid). Having shown that a photograph can be a composition, we have come to the conclusion that photography is an art form.

Although not flawless, for example he seems to believe that photographers do not compose, his deductive reasoning is particularly valuable to the discussion of the status of photography as art. Indeed, the aesthetic quality of composition is something common to all art works, such as paintings, music, poems, sculptures and photographs. We should notice that how we compose a picture closely relates to how we perceive a picture. The Gestalt laws, which might better be thought of as guiding principles, attempt to describe in a clear way how we segregate and group visual information. These principles are important to composing, because if a photographer knows how a

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[11] Compared with paintings, Arnheim argues that photographic work is consistently limited in its range of expression as well as in the depth of its insights. However, Arnheim also reminds us that the fault maybe ours if we look at a photograph from the point of view of the painter (ibid.).

person most probably organizes or groups visual elements when looking at a photograph, the elements can be arranged to favor certain groupings. "Visual elements that are close together, that are similar, that form a smooth contour, and that allow for closure can produce an effective composition" (Zakia, 2002: p.61). There is a flip side to the Gestalt principles. If we know how to arrange elements so they are easy to group visually, we also know how to arrange them so they are difficult to group. In general terms, 'breaking the rules' can be seen as the same as 'applying the principles', in that the former is a variant of the latter.

The question now arises: how reasonable is the proposition that a photographer can only *transfix* nature's compositions to one's own images (Trachtenberg, 1980: p.139)? If this is true, it seems to suggest that a photograph can be a work of art but a photographer can not be an artist. Furthermore, it can not explain why different photographers have different compositions for the same subject, which the researcher perceives as the true meaning of composing, and why photography can be an art form. That is, creativity resides in the artist, not in nature. The same can be seen in the following quotation:

"It must be admitted by the most determined opponent of photography as a fine art that the same object represented by different photographers will produce different pictorial results and this invariably not only because the one man uses different lenses and chemicals than the other but because there is something different in each man's mind which somehow gets communicated to his fingers' ends and thence to his pictures" (Robinson in Harker, 1988: p.46).

There remains a second question: whether composition is common to all the fine arts? This issue is addressed in two aspects. First, Morris Weitz using Wittgenstein argues that there are no characteristics essential to all arts (1956, p.27 – 35). His ideas can best be summarized as below:

"My intention is ... to make a much more fundamental criticism, namely, that aesthetic theory is a logically vain attempt to define what cannot be defined, to state the necessary and sufficient properties of that which has no necessary and sufficient properties, to conceive the concept of art as closed when its very use reveals and demands its openness" (ibid, p.30).

The argument against common features and therefore definitions of art is, according to Weitz, that art is an open concept. He argues that it is the very expansive,

adventurous nature of art, its ever-present changes and novel creations, makes it 'logically' impossible to ensure any set of defining properties. New conditions, new art forms and new movements have constantly emerged, for which aestheticians may put forward similarity conditions but never necessary and sufficient ones for the appropriate application of the concept of art (1956, p.32). Weitz has made a valuable contribution to our understanding of art in that he points out the fundamental problem of aesthetic theory lies in taking a concept of a closed set of artwork, discerning some common features among them, and using this result to declare that all works of art must have these features.

Although new works and forms of work may have something in common with what went before, according to Weitz, this does not mean that they and their predecessors share one common feature. He draws on Wittgenstein to say that these new works may only have 'family resemblances' to previous works and may have no one common feature with all their predecessors. But this does nothing to establish his claim that art has no essence. The notion of family resemblances, Colin Lyas argues, is not meant to show that individual works of art do not have something in common. It is introduced to show that the different linguistic forms of life, such as aesthetic or science or religion, need not have one thing in common. These forms of life, as the family resemblance image suggests, do share features. Our dealings with the aesthetic may have subdivisions between which there is little in common. An interest in a woman in a photograph might differ from an interest in the same woman in a painting. That does not stop our dealings with photographs or paintings, or works of art in general, to have some unifying characteristics (1997, p.87 – 88).

The second aspect of whether composition is common to all arts is best exemplified in John Berger's argument that composition "in the profound, formative sense of the word cannot enter into photography" (Trachtenberg, 1980: p.292). He suggests that the statement *the good photograph is the well composed one* is true only insofar as we think of photographs *imitating* paintings. Painting, he adds, is an art of arrangement, in which some kind of order needs to be established. Furthermore, every relation between forms in a painting is to some extent adaptable to the painter's purpose. This is not the case with photography for the formal arrangement of a photograph explains nothing. But the fault is his since he is looking at a photograph from the eye of the painter. The photographer does compose, but he composes under a definite ceiling. That is, the photographic composition seems to be limited by its intimate physical connection with reality. A photographic image is a kind of compromise product between physical reality as it impresses its own optical image on the medium and the

picture taker's ability to select, shape, and organize the raw material (Arnheim, 1986: p.113). Siegfried Kracauer (in Arnheim, 1986) suggests that the optically projected image is characterized by:

"the visual accidents of a world that has not been created for the convenience of the photographer, and it would be a mistake to force these unwieldy data of reality into the straitjacket of pictorial composition. Indefiniteness, endlessness, random arrangement should be considered legitimate and indeed necessary qualities of a photograph" (p.110).

Arnheim argues that these qualities are necessary because they alone derive logically from the unique conditions of the photographic medium and thereby create a view of reality not offered by any another medium. Perhaps this is the case with photography.

Let us now return to the question as to whether Gestalt theory is applicable to photography. Here we are helped by the RIT[12] photography teacher and emeritus professor, Richard D. Zakia, who based his photography teaching on Gestalt laws. He states that the ideas of gestalt, figure-ground, simplicity, and the Gestalt laws of perceptual organization helped him better to understand and articulate the compositional features, that is, the visual syntax of photographs, and the introduction of Gestalt principles in his photography classes was well received by the students and incorporated into their work. Furthermore, he adds:

"Over the years students from other disciplines [other than photography], such as graphic design, printing, audiovisual, advertising, and communications, have selected the course [Perception and Photography]. This was highly stimulating and exciting for it challenged me to discover how universal and applicable Gestalt principles are" (Zakia, 1993: p.68).

Concerning how the researcher's own students incorporated these principles into their work, readers are referred to section 2.3 and Chapter 6 of the thesis for some good examples.

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12 RIT: Rochester Institute of Technology.

2.9 Criticism of Gestalt theory

Gestalt psychologists' faith in the capacity of the theory to provide universal laws describing mental activity inevitably attracts substantial criticisms, among them that Gestalt concentrates on form rather than on content; that fixed Gestalt laws are incompatible with changing standards of the taste of works of art; that Gestalt isomorphism has important limitations. These issues are addressed in the following subsections.

2.9.1 Gestalt concentrates on form rather than on content

Timothy Binkley (1976) argues that Arnheim's views, and perhaps Gestalt psychologists' views in general, are skewed too heavily toward perceptual form. Here, he cites Arnheim's analysis of how Gestalt theory is applied to particular works of art. In discussing Ingre's *La Source* (see figure 2.21), Arnheim considers that the picture plays on the theme of "withheld but promised femininity". He states that:

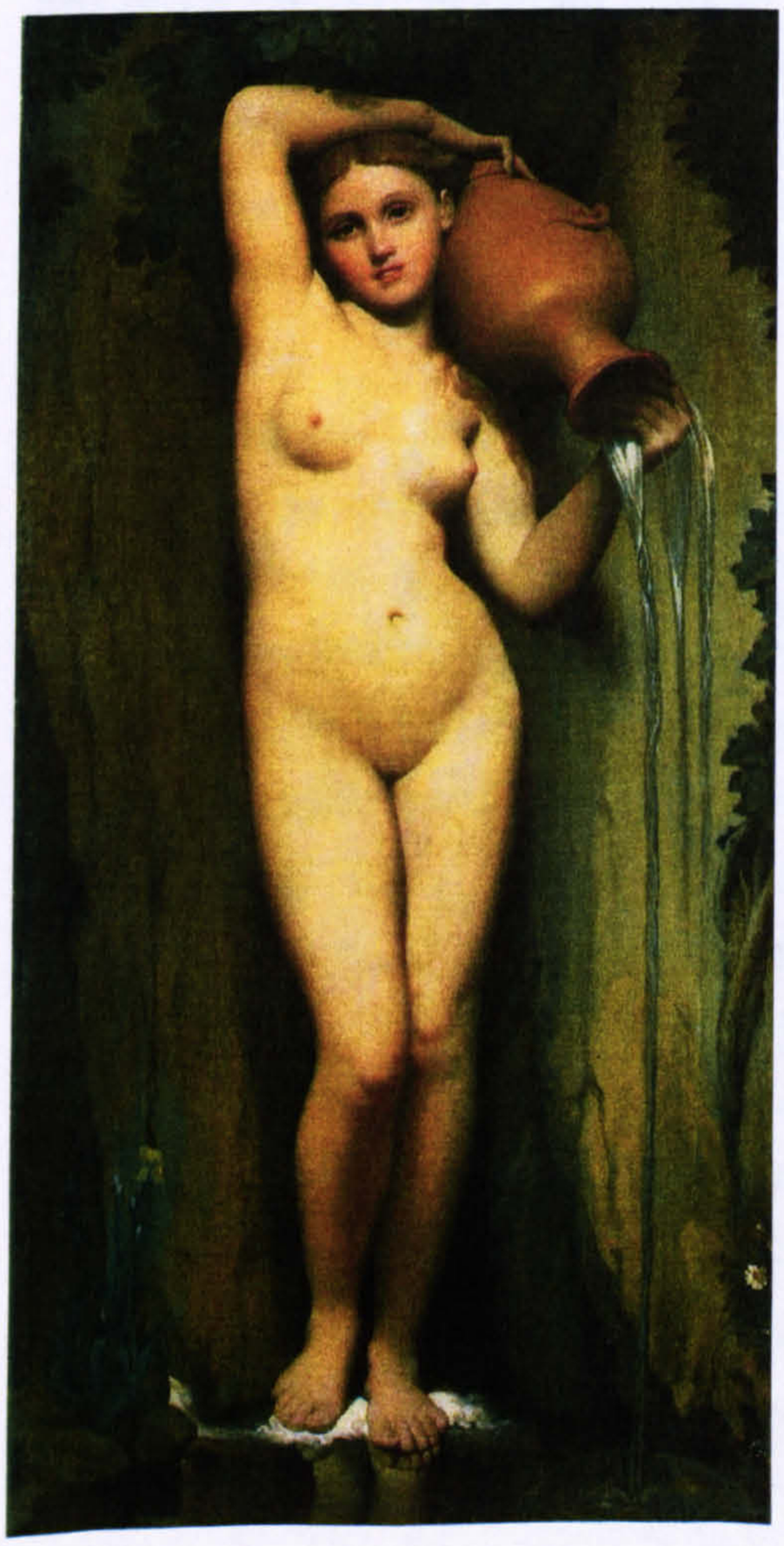


Figure 2.22

"Both aspects of this theme are developed in further formal inventions. The virginal refusal in the compression of the knees, the tight adherence of the arm to the head, and the grip of the hands are counteracted by the full exposure of the body" (1974, p.154).

Binkley refutes this argument by saying that it is important to recognize that here "the visual form is shown to serve the artistic expression, but not to determine it. The meaning of the compression of the knees cannot be understood unless we see the visual compression as a compression of the *knees,* and know what that means. To the child unfamiliar with sex, the compression may be evident in the visual form, but not the theme of 'withheld femininity'. The point is that a great deal can be expressed in a painting which is not strictly based on its visual form" (1976, p. 361 – 364).

He believes that not only the concern for visual appearance, but also the concern for visual form itself, is optional in making and appreciating art. In a poem, the beauty of the language, but not the handwriting, may be important, and the most exquisite poem can be penned in such haste as to be nearly illegible. He adds that *subject matter* and *perspective* are the factors which should be taken into account in the particular human endeavor. The former is never strictly determined by visual form, and the latter, which holds a considerable appeal to the intellect, does not speak to the eye through percepts alone (ibid).

A few remarks should be made here. First, the author could ask how an exquisite, *illegible* poem can be fully appreciated in the first place; second, Binkley to some extent is right in claiming that subject matter is also important to artistic expression; third, as to whether perspective holds substantial appeal to the intellect, readers are referred to John M. Kennedy's studies of perspective effects in drawings of the blind. He examines to what extent they are able to recognize and to represent perspective. He found that some sense of perspective was present even in the congenitally blind, which led him to claim that perspective was part of nature rather than nurture (1993, p.180 – 215). This claim is consonant with Arnheim's statement that the depth perception derives from the law of simplicity, namely, the most fundamental principle of visual perception (1974, p.248; 1981, p.222). Furthermore, a distinction should be made between an ability to perceive perspective and an ability to represent perspective, and while it may be true that there is a universal ability to perceive spatially, ability to represent spatially is very much educationally determined.

2.9.2 Compatibility between Gestalt theory and changing standards of artistic taste

In response to Arnheim's criticism of his 'aesthetic relativism and atheism'[13], David Carrier claims that changes in aesthetic judgment may not be compatible with fixed laws of perception (1986, P.251 – 254). In his article "Theoretical Perspectives on the Arts, Sciences and Technology", Carrier gave a clear example of how art relativism can be possible:

"In late nineteenth-century France, Gérôme and Bouguereau were famous, Degas and Cézanne scorned. By the mid-twentieth century, this judgment of relative value had been reversed. Today works by all these painters are found in the Metropolitan Museum, a further reversal of taste which has angered those critics who feel that Bouguereau and Gerome do not belong in the same museum with Degas and Cézanne" (ibid, p.253).

He argues that though the reputations of some artists have remained fixed, the history of taste shows that a certain degree of relativism is a fact. Thus, Carrier queries whether such an analysis of changing standards of taste can be compatible with the belief that the laws of the Gestalt psychologist are universally applicable. Arnheim replies that there can be no disagreement on the insistence that different people at different times perceive things differently. He further asserts:

"What matters is the unwarranted conclusion [of aesthetic relativism] that the world as given has no character of its own and that therefore our percepts and values are entirely at the mercy of subjective preferences and accidental conventions" (ibid, p.254).

Arnheim believes that one of the essential features of the Gestalt approach is the respect for the stimulus, that is, the axiomatic assumption that images of the visual world come to us not as amorphous raw material but as structures, for the reason that every works of art derives its primary power and meaning from its perceptual structure. Visual features such as the interplay of activating and balancing forces of Cézanne's portrait of his wife in a yellow chair (see figure 2.19) provide the universally human perceptual base that is modulated secondarily by particular cultural or personal conditions. The Gestalt approach, according to Arnheim, is not in conflict with that of art historians but, on the contrary, is meant to contribute to

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[13] This is not the place to describe in detail what aesthetic atheism is; readers are referred to Carrier's article "On the Possibility of Aesthetic Atheism" for further information (1985, p. 35 – 38).

the very premise on which sensible art history builds (1986, p.254 – 255).

2.9.3 The limitations of Gestalt isomorphism

In a review of Arnheim's book "Art and Visual Perception", Kennedy poses an important question on Gestalt isomorphism (or in his own words, parallelism), in that he queries its limits. The nature of Gestalt isomorphism is that while the world has material and life and spirit, each domain has a form which parallels the other[14]. To begin with the intuitive approach of isomorphism, Kennedy considers the problem of good and evil at the heart of any confrontation with artwork in particular or human civilization in general. In an analysis of Picasso's "Guernica", he finds Arnheim's examination of the painting (1962) brings him more of its rounded whole in his grasp of "the deadly paradoxical pairings of good and evil" (Kennedy, 1980: p.119). But more is needed, he believes, more than just examples well analyzed. Kennedy argues that the isomorphism between the realms of spirit, life and activity needs judicious explanation. It is a hindrance to our understanding of Arnheim's approach that he offers us the magnetism of his vision without delineating the circumscriptions (ibid).

Kennedy reminds us that even the most enthusiastic user of isomorphism must acknowledge that good and evil belong to the spiritual realm only, and indeed they are its defining characteristics. He further adds:

"There is no good or evil in biology, nor is there good and evil in physics. However close are the parallels between the spiritual, biological and physical realms, they do not consist of identical entities" (ibid, p.119).

The parallels, according to Kennedy, may be those of form, of pattern or of rhythm. Similar sentiments are also expressed by Arnheim on numerous occasions (e.g. 1974, p.1 – p.9; 1987, p.210). It is not to see good and evil directly, but it is in fact good and evil pictorially depicted. Therefore, without a clear explanation of the entities of the various realms invoked and without clear distinctions between the ways in which parallels can be drawn Arnheim can be read incautiously by the naive and with disappointment by critics. However, if the distinctions and limits were made clear, it would be easier to read him with appreciation for the enrichment he brings and the love of the vision he follows (Kennedy, 1980: p.118 – 119).

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[14] More specifically, Gestalt psychologists believe that outer physical world and inner mental world are isomorphic with each other. Readers are referred to section 2.4 for further information.

In summary, this chapter has reviewed the content, applicability and limits of Gestalt theory in the literature. As a conclusion, the author would like to include a quotation found in Arnheim's article "The two faces of Gestalt Theory" (1992). At the end of the essay, in an attempt to delineate the character of Gestalt theory in contrast with the popular image it has taken since the early twenty century, he says:

"... rather than limit itself to offering a method of combining and segregating perceptual shapes, gestalt theory is concerned primarily with the complex dynamics of organization in field situations, be they physical or psychological. This dynamics is not fully described by the tendency toward simple, regular, symmetrical structure but requires acknowledgment of a countertendency that meets tension reduction with tension enhancement. The countertendency articulates physical and psychological units or objects in interaction with the equilibrating force. And, finally, although gestalt psychologists in what may be called their polemical period had to concentrate many of their demonstrations and discussions on the organizational and self-regulatory aspects of gestalt structure, they were very much concerned from the beginning with the biological, cognitive, and aesthetic reward of gestalt processes, namely, the creation of well-functioning, stable, and clarifying patterns in nature, science, and art – a perfection difficult or impossible to obtain otherwise" (1992, p.213).

Chapter 3 Assessment in Photography

Despite the immense popularity of photography in modern society, and the importance of its contribution to contemporary culture, there is very little literature which bears directly on photography teaching and assessment in academic circles (Newbury, 1995; Rogers and Allen, 1996). The existing, sparse publications or articles either focus on the vocational training aspect of photographic education such as BTEC Higher Nationals in Photography (2005) or serve only as guidance for school or university teachers and students (e.g. Canada Department of Education website: www.education.gov.ab.ca). It is quite understandable that Dr. Lon Clay Hill[1], having once listened to the author's description, then described photography as an "*academic orphan*". Therefore, this chapter is restricted to dealing with the existing articles and assessment literature in general.

The author decided to devote one chapter to assessment issues because assessing student progress was one of the major concerns of the research, and a reliable assessment of student work, either as the teacher's sole practice or as teamwork, was necessary to provide evidence that the results reflected student progress and therefore justify the main argument. That is, image analysis based on Gestalt theory is helpful in improving students' understanding and practice in photography.

The purpose of this chapter is to examine generally the issues of assessment procedures and instruments, with emphases on their formative roles. The presentation will start with a discussion of the process and standards of assessment (3.1). The discussion then turns to the characteristics of formative assessment and its close link to the improvement of learning (3.2). This will be followed by a review of the literature of the development and use of assessment criteria and instruments (3.3). It is then followed by some general conclusions and a summary.

3.1 Assessment design

Richard Stiggins (2001) proposes a *five-step process* for developing a sound assessment, which involves a sequence of:

- having clear targets
- understanding assessment purposes

[1] Dr. Lon Clay Hill was invited to the university I taught three years ago as a professional writing consultant.

- using proper method
- sampling representatively
- preventing bias and distortion.

Since the author bases his assessment design on Stiggins's theoretical framework (1996, 2001), this section involves a detailed review of his five-step process, supplemented by some relevant literature.

Having clear and appropriate targets, Stiggins argues, will result in three valuable benefits, which are limits on teacher accountability (delimiting responsibility), benefits in student motivation and a manageable teacher workload. Here and thereafter, he seems to base his views consistently on the concept of *mastery learning* – learning is not about ability, but about effort (Carroll, 1963 & 1989; McNeil, 1969).

The key elements in mastery learning are: (1) clearly specifying what is to be learned and how it will be evaluated, (2) allowing students to learn at their own pace, (3) assessing student progress and providing appropriate feedback or remediation, and (4) testing that final learning criterion has been achieved (**TIP**: Theory Into Practice database). These are inextricably linked with Stiggins' guiding principles about classroom assessment (see figure 3.1; Stiggins, 2001: p.18).

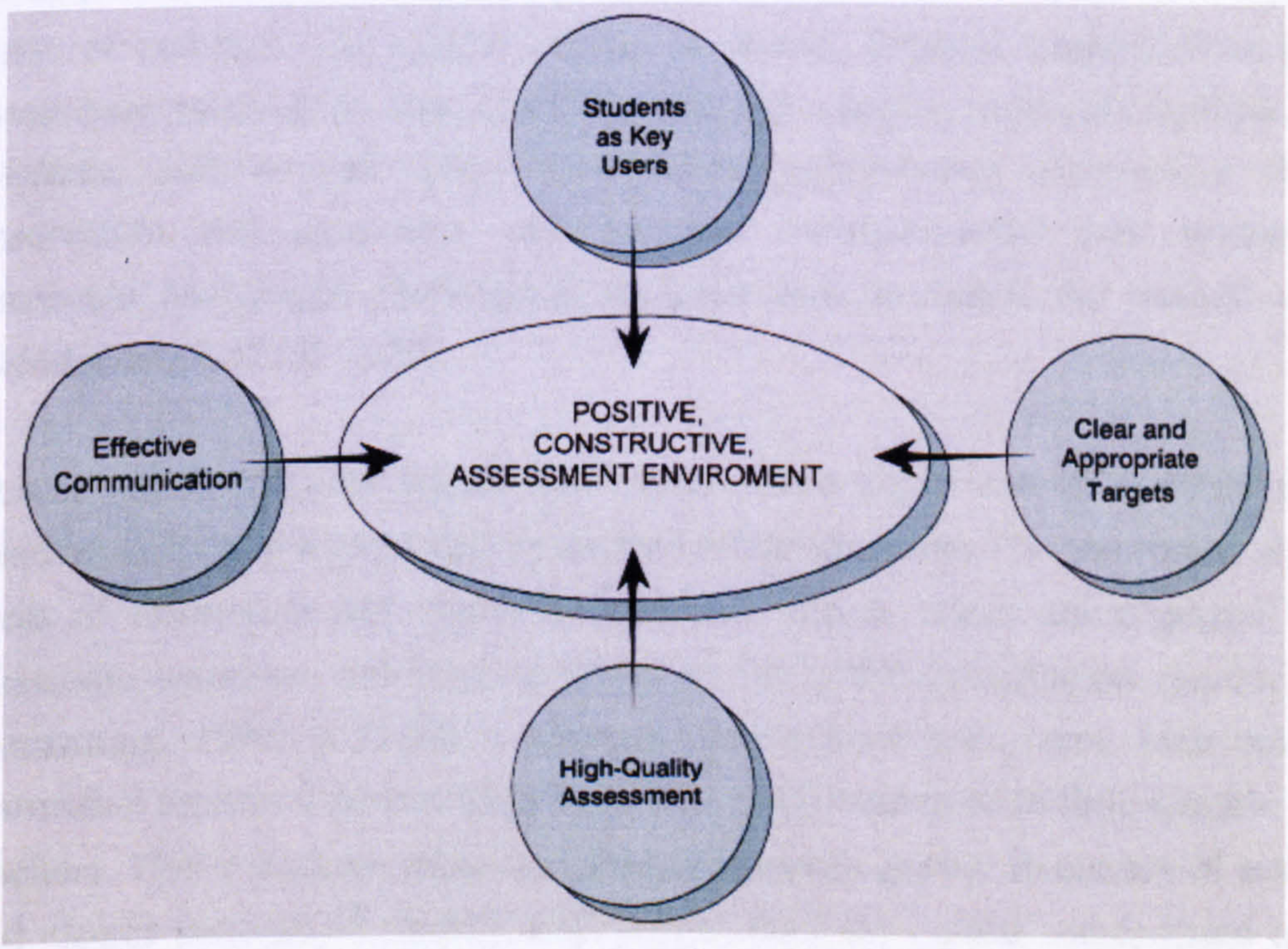


Figure 3.1 A set of guiding principles for a sound assessment.

Furthermore, Stiggins believes that if the teacher can share his vision of success with his students, they will achieve success, regardless of their ability. "If they can see it, they can hit it" (2001: p.83). However, the concept of mastery learning might be questionable. The reviews by Block and Burns (1976) and Guskey and Gates (1986) show that when the age of the students (elementary and secondary) involved in their studies is examined, it appears that mastery learning is less effective for older students. This is echoed by the 1990 review of Kulik et al., in which the effect sizes found were smaller than found by the previous reviews, not surprising given the greater representation of their studies with students over 18 years of age (Black and William, 1998: p.35).

Understanding assessment purpose helps the teacher take students' needs into account in developing and implementing the assessment. Stiggins proposes three levels of the use of assessment results, which are classroom level, instructional support level and policy-making level. Given the aim and orientation of this thesis (an action research), discussion of the latter two is excluded. At classroom level, Stiggins argues, teachers and students gather and use the results of student assessments to inform a variety of decisions that influence both student motivation and their level of success (2001: p.31). These call for the formative use of assessment, which will be discussed in detail in the section on Formative assessment.

Using proper method indicates the use of a method which is capable of reflecting the kinds of outcomes the teacher wishes to access. Stiggins suggests four different assessment methods to use, including *selected response methods* (multiple choice, true/false and so on), *essay assessments*, *performance assessments* (base on observation and judgment), and *personal communication* with students. The classroom assessment challenge is to know how to match the method with the intended target (2001: p.22).

This is not to discount standardized tests, which allow one to ascertain students' relative position in a large, clearly defined reference group. The test results also show areas of instruction that could be improved, special needs unrecognized in daily classroom activities and learning problems for which remediation can be planned (Armstrong, 1994: p.49-50). Although standardized tests serve both policy and instruction support function, Stiggins believes they tend to be of little specific value to teachers. This is because classroom demands require greater frequency of assessment and clearer pictures of student achievement than the typical standardized tests can provide (2001: p.405). These, again, call for formative assessment.

Non-traditional assessment, such as performance assessment, is time consuming and requires careful preplanning. Stiggins perceives performance assessment as a labor-intensive method, and he suggests considering the method only when there is time to conduct it. Teacher's training, performance samples, scoring sheets with specified criteria and student involvement, all allow a more efficient use of a teacher's time and contribute to the accuracy of an assessment instrument (Stiggins,2001; Armstrong, 1994; Dorn, Madeja & Sabol, 2002).

Given the range of our valued targets, there may be no single method which can serve all of our assessment needs at different levels. Therefore, Stiggins argues that we will need to apply some or all of the above-mentioned assessment methods at our disposal. For example, if a teacher would like to track student achievement over time, preserve the detailed picture of student performance, or provide excellent opportunities for students to analyze and reflect on their own work, then a portfolio system which combines different assessment methods can come into use.

Stiggins indicates clearly that, in current professional literature, it is quite common to see reference to portfolios as "portfolio assessment" (e.g. Consumer Guide, OERI of the US Department of Education) or find the concepts of performance assessment and portfolios closely linked, but he perceives these to be common misconceptions. He emphasizes that in fact the context (purpose and target) within which we use portfolios may require that we assemble information from several assessments using several different assessment methods to tell a full story. It's the combination of these multiple assessments that underpin and give meaning to the message. For this reason, Stiggins thinks of portfolios as a communication system rather than an assessment system (2001: p.471). Here, he differentiates these two types of system, but it may be reasonable to ask what makes that difference. This is because on the one hand Stiggins perceives using portfolios as a communication mode instead of an assessment method, but on the other hand he emphasizes the use of *personal communication* as one of his major assessment methods, which can probe achievement far more deeply than can the other alternatives (2001: p.89).

Sampling representatively helps the teacher yield dependable conclusions as to students' possible overall results over a complete set of exercises. The realities of classroom assessment require the teacher generalize from his or her sample about the total performance domain being assessed (Stiggins, 2001: p.22, p.213-216). However, it's difficult to determine how many exercises we need within any particular assessment to draw confident conclusions about student proficiency. In a one hour

paper-and-pencil test we can administer many multiple-choice items, and thus ensure a wider coverage with our sample, because each item requires little response time. It becomes problematical if a performance assessment exercise, which normally demands a more complex demonstration, takes as long as 30 minutes. Clearly with performance assessment we cannot administer as many items as selected response methods per unit of testing time. Therefore, it can be very difficult to sample performance adequately using a number of different exercises, given the classroom workload and time constrains.

It is difficult to decide how to sample student performance adequately, and the decision may be left entirely to the teacher's professional judgment based on his or her prior experience. Stiggins provides us with a clear example of a sampling decision rule, citing an elementary teacher Lopez:

"Now remember, this is really a matter of my professional judgment based on prior experience with the targets and with kids. I feel that I have presented enough exercises and gathered enough instances of student performance when I am quite certain that I can accurately predict how well they would do if I gave them one additional exercise" (p.214).

The final step demands the teacher design, develop and use assessments that allow him or her to *avoid bias and distortion* which can cause misrepresentation of student achievement. Bias occurs when factors other than the kind of achievement being assessed, such as personal prejudices or physical or mental fatigue, begin to influence the teacher's judgment.

The teacher can examine the degree of reliability of his ratings by comparing them with the judgments of another qualified assessor who independently score the same student work applying the same criteria. After the evaluation, Stiggins argues, if two assessors generally agree on the performance demonstrated, then we have evidence that the results reflect student proficiency (2001: p.218-219). However, technically speaking, we may get a high level of inter-rater correlation when the assessors' ratings have similar patterns but at different levels, for example, when one assessor is systematically 'tougher' than another (Baume & Yorke, 2002: p.14). The assessors obviously have applied different standards.

It's possible to adjust the construction of assessment methods to deal with the effects of bias and distortion that may have caused differences in the ratings of different

groups. For example, in general, girls do better on essay-type questions, but do not perform as well as boys on multiple-choice items. Therefore, it would be possible to ensure that girls have the same group average as boys by adjusting the mix of essay and multiple-choice questions (Black, 1998: p.50 – 51). Black argues that to do this would be to pursue equality of outcomes. Here, Goldstein suggests that it is useful to distinguish 'group difference', which is an empirical fact, from 'bias', which is a judgment about the relevance or irrelevance of that difference to the attribute being assessed (1996: p.89). Indeed, the processes of adjustment would be counter-productive if the purpose of the assessment was to reveal effects of discriminatory practice in education (Black, 1998: p.52).

The five steps are not designed to form a hierarchy. None of the steps, or five quality standards, in Stiggins' words, is more prominent than the others. All assessments must meet all standards. Violating any of the standards is to risk inaccuracy, placing students' academic well-being in jeopardy (2001: p.20).

3.2 Formative assessment

Raising standards of learning

It is important to consider that over the course of a semester, teachers can take many opportunities to assess how students are learning and then use this information to make helpful changes in instruction. Black and William (1998b) use the term 'assessment' generally to refer to all activities that teachers and students undertaken to get information to be used diagnostically to modify teaching and learning. Such assessment becomes formative only when the information is used to adapt the teaching and learning to meet student needs.

The overall weight of research evidence is that formative assessment by teachers can raise standards of learning and improve motivation (Black, 1998: p.122). Black and William (1998a) conducted a comprehensive review of 250 publications selected from a much larger pool to examine whether formative assessment can raise academic standards in the classroom. They concluded that attention to the formative use of assessment can lead to significant learning gains. The effect sizes between students involved in the innovations and students of typical groups on the same tests ranged from 0.3 to 0.82. They also found that formative assessment is more effective for disadvantaged and low-achieving students, thus tending to reduce the range of achievement in the cohort (1998a: p.42 & p.53).

Feedback

The concept of feedback and that of formative assessment overlap strongly, and the quality of the feedback provided is a key feature in any procedure for formative assessment. Feedback can help a learner realize the gap between the actual level and the reference level of his or her knowledge, understanding and skills and guide the learner through actions necessary to close that gap (Ramaprasad, 1983).

Many assessments carried out by teachers or researchers are in fact summative because they are not used to guide follow-up changes in the teaching and learning activities. An example is an experimental research in mathematics teaching in which 120 college students were placed in one of four groups in a 2x2 research design for a algebra course covering 7 chapters of a text (Martinez & Martinez, 1992). Two groups were given one test per chapter, the other two groups three tests per chapter. The results of a post-test showed a significant gain for those tested more frequently. The authors concluded that the more frequent testing was indeed effective. However, one could question whether the frequent testing really constitutes formative assessment. This can be true even in relation to frequent homework and coursework, in the absence of effective feedback, where the practice can be described as only "frequent summative" (Black, 1998: p.117).

Two studies by Butler (1987, 1988) have shown that simply giving grades or praise can have negative effects. In the 1987 study, Butler examined the effects of four kinds of feedback (comments, grades, praise, no feedback) on the performance of 200 Israeli fifth- and sixth-grade students in divergent thinking tests. It showed that:

- on the post-test, the students given comments scored one standard deviation higher than the other groups, but those given grades and praise had made no more progress than those given no feedback.
- In a follow-up questionnaire study, the students given grades and praise scored substantially higher than the other groups on measures of ego-involvement while those given comments scored higher than the other 3 groups on measures of task-involvement.

The results (1987, 1988) are consistent with literature (Cameron & Pierce, 1994) which indicates that task-involving evaluation is more effective than ego-involving evaluation, while praise and supportive feedback has little effect on performance (Black & William, 1998a: p. 44). The most effective feedback on tests and homework

concentrates on the correction of errors, with suggestions for improvement, and direct students' attention to the tasks rather than the right answers (Bangert-Drowns, Kulick, & Morgan, 1991; Elawar & Corno, 1985).

Techniques for developing formative assessment

Although evidence shows that formative assessment is an essential component of classroom work and that its development can raise standards of learning, the current, overall picture is one of weak practice (Black, 1998: p.111). In order to develop and implement formative assessment, techniques such as teacher observations, teacher-student dialogues, and group discussions should have an important place alongside specific, focused feedback (ibid, p. 113 – 114). With performance assessment, we observe students while they are performing or we examine the products they have created and evaluate the level of proficiency demonstrated. Stiggins believes that, for example, observation might be an appropriate approach to evaluating student dispositions (2001, p.101 – 102 & p.358 – 362). A work sheet to be completed by each student or group discussions followed by reports can all help to elicit useful information if the responses evoked are closely linked to statements about specific aims, that is, they are grounded in the criterion referencing which formative assessment inevitably needs (Black, 1998: p.113 – 114).

For formative purposes, it will often be particular weaknesses or strengths that might be selected for feedback topics. Black (1998) cautions that while the learning work is a production task rather than a responsive task, e.g. an essay on Gestalt theory or an imaginative work, the choice between holistic and analytic evaluation procedures will arise. Whatever the two approaches are used, it seems that clear qualitative descriptions of the key characteristics of a piece of work are essential for both purposes, whereas grades and praise will be of little use (p. 113 – 114).

The collection of samples of student work in portfolios may also be used formatively, although these are more relèvant to summative use. The formative aspect resides in the immediate appraisal of the individual pieces of work produced, in the selection of pieces of work in a portfolio and in the preparation of a summary report to the portfolio, where those are undertaken in negotiation between teacher and students (Black, 1998: p.115). It is arguable whether the negotiation process is necessary. Although it is possible for a teacher to negotiate with a student about what should be included in a portfolio, the true instructional value and power of assembling the portfolio comes when the student use criteria and self-reflection to make decisions

about what he or she wants to show and why. That implies self-selection of portfolio content. The work included in the portfolio is that which best tells the story the student wants to tell (Arter & Spandel, 1992: p.38). Here, the extent to which whether the students can make their own decisions may depend on their age.

3.3 Assessment criteria and instruments

3.3.1 Assessment criteria

Given that the purpose of formative assessment is to identify student learning needs, it clearly requires criterion referencing. The criterion emphasis will mean that assessment criteria and tasks are formulated for their relevance to the teaching and learning programme (Black, 1998: p.62-63 & p.106). Performance criteria should specify in descriptive detail the nature of the expected outcomes. A criterion represents what a teacher intended to teach and what is examined to see if students did indeed learn what the teacher thought was taught (Armstrong, 1994: p.191). The purpose of assessment is to ensure that effective learning of the content of teaching has taken place, and assessment of the evidence of this learning relates directly to the assessment criteria for that content.

The BTEC[2] Higher National in Photography guidebook provides a clear link between the learning outcomes and assessment criteria of photography. To cite two examples, in the "Photographic Technique" unit, the criteria for the outcome "Produce, record and reference images in a range of locations" are listed below.

To achieve this outcome a student must show "the ability to:

- use photographic materials and equipment correctly, efficiently and effectively;
- select appropriate techniques to create images in a variety of indoor and exterior situations[3]" (2005: p.31).

For a unit consisting of 60 guided learning hours, it is arguable whether such general and somewhat vague outlines can be of any help to the teacher and students.

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[2] The **Business & Technician Education Council** (BTEC) was a subdegree-conferring council in the United Kingdom until 1996, when its functions were transferred to Edexcel. The council offered further and higher education awards, particularly to polytechnics, and in particular the *BTEC Nationals* and *BTEC Higher Nationals* awards which remain prominent.

[3] These are two out of a total of nine criteria for a 60-hour learning unit.

In the "Interpreting Images" unit, one of the intended learning outcomes is that the learners must "produce independent, imaginative and complex work that communicates messages and meaning", and the assessment criteria for achieving that goal are that the student must demonstrate "the ability to:

- produce a portfolio of imaginative and complex work;
- show diverse and creative use of visual language (scale, size, proportion, colour, tone, use of text" (ibid, p.85).

Once again, evaluations of student performance are left to the teacher alone. It seems that these criteria are to be used only as guidelines in the evaluation process. It is the teacher's intuitive understanding of and familiarity with the performance of his or her students that is to play an important role in that process (Dorn, Madeja & Sabol, 2004).

3.3.2 Assessment instruments

Scoring rubrics

Although performance assessment is not something new to art teachers, the development of scoring instrument that focus on providing a range of grades for scoring each task, i.e. scoring rubrics, is quite new. Using rubrics in the scoring process is an approach most frequently adopted in performance assessment (Dorn et al, 2004: p.101 – 102). Rubrics provide a reference point for making a scoring decision using a Likert-type scale. The scale used is normally criterion referenced, which specifies the level of performance students should be able to attain in a particular context. In designing a scoring rubric, Dorn et al suggest:

- The demands of student performance should closely match the criteria used in scoring;
- It should specify a certain observable aspects of the performance or product to be looked for and scored;
- It should be written in ordinary language so that assessment results can be understood by all (ibid, p.103).

In any performance assessment context, we have two options in the process of scoring: holistic and analytical. Both require explicit performance criteria. These two scoring methods use the criteria in different ways and therefore fit into different contexts.

When scoring analytically, we divide performance into a number of dimensions, evaluating and assigning a score or grade to each dimension. This produces a profile of student performance that may be more diagnostic in improving teaching and learning but is time consuming and requires more effort. When scoring holistically, we consider all of the criteria simultaneously, making an overall evaluation of performance. Although more efficient, the latter provides only *a general sense of performance* that does not reflect the quality of student work (Armstrong, 1994: p.148 – 149). In a classroom context, when the teacher needs a holistic score, Stiggins recommends that he or she can generate it by summarizing or averaging analytical scores (2001, p.210).

A scoring rubric with two or more scales or dimensions is called an analytical rubric. This contrasts with a scoring rubric that assesses student achievement using only one single scale that yields a holistic score (Idea and rubrics, 2006). Black suggests a similar idea to the analytical scoring, that is, an assessment domain can be divided into a number of component areas of knowledge and skills. Again the assessment and the scoring would produce a profile of performances, i.e. a set of scores. However, it is possible that any single component score would still involve a generalization over two or more aspects (1998: p.69-71).

A scoring sheet

During the assessment process, assessors might not be able to remember and hence to apply all the assessment criteria to judge student work. Therefore it would be helpful to devise a scoring sheet which combines the criteria and rubrics on a single piece of paper as an effective evaluation and scoring instrument. Furthermore, the scoring sheet would certainly help the teacher address the potential problem of a mismatch between assessment and teaching aims, ensuring the assessment of student performance related directly to the criteria for the curriculum content. In other words, teaching and assessment are in alignment with each other (Webb, 1997: p.3-4).

3.4 Summary

This chapter has provided some selective reviews of the development of assessment. The key concept is that of formative assessment. It is time consuming and requires more effort from the teacher. Only sketches of issues about assessment in photography have been made, focusing mostly on the practicality of performance criteria and their relevance to teaching and learning. A brief review of assessment

instruments is in the previous section. The most practical part of the presentation in this chapter lay in discussing the five practical steps for developing a sound assessment, emphasizing the formative role in the process.

Chapter 4 Methodology

The primary purpose of this research project is to provide sufficient evidence for the claim that the integration of image analysis with Gestalt psychology can be helpful in improving students' understanding and practice in photography. In this chapter, the author intends to show how he approached the subject through a set of empirical procedures including data collection and analysis. This chapter will be presented in six sections, ordered as below:

4.1 Research framework
4.2 Research contexts
4.3 The pilot study
4.4 Data collection
4.5 Data analysis
4.6 Limitations of the study
4.7 A brief summary

Section 4.1 describes and illustrates the theoretical framework, i.e. an action research, of the thesis study; section 4.2 depicts the context and participants of the research project; section 4.3 reports the procedures and results of a pilot study and its implications for the main study; sections 4.4 and 4.5 present methods and procedures for collecting and analyzing empirical data; a final section, 4.6, discusses the limitations of the empirical procedures and the research design.

4.1 Research Framework

This research project consisted of three major phases. The first phase was a pilot study, which was carried out between September 2005 and February 2006. The second phase was a main study, which started in February 2006 and ended in June 2006. The final one was a thesis-writing phase starting from June 2006, and completed in July 2008. A time frame for the project is presented in Table 4.1.

Sep, 2005	**Feb, 2006**	**Jun, 2006 ⋯** **July, 2008**
Data collection Data analysis	Data collection Data analysis	Data analysis Data interpretation Thesis writing
Phase 1: The Pilot Study	**Phase 2: The Main Study**	**Phase 3: Thesis Writing**

Table 4.1 A time frame for the research project.

During the pilot stage of the study, the researcher adopted a rigorous approach to teaching photography and addressing research questions by integrating teaching with research. A set of empirical procedures for collecting and interpreting relevant data was developed and tested in order to justify the researcher's claim that image analysis can be helpful in improving students' learning in photography. The characteristics of the research at this stage could be summarized as follows:

- Problem-posing: The teacher firstly identified the technique-led curriculum as the major problem in photographic education in Taiwan and also in his classroom. This is because it limited the scope of learners' production and appreciation of photography. The photography courses he taught were imbalanced, focusing more on the production process such as exposure and composition than on the appreciation of photographs.

- Bringing change: the teacher introduced the concepts of Gestalt psychology into his photography course to develop students' ability to appreciate and produce photographs. The teacher felt the need for a change or improvement in photography teaching and learning, and therefore translated his ideas into action in his classroom.

- Teacher as researcher: the teacher adopted a researcher perspective to his own teaching, that is, the teacher examined his own practice critically and

systematically through devices such as student learning diaries and a teaching journal (Stenhouse, 1975: p.156). To check that the practice was as the teacher intended and verify claims that he had improved the situation, the teacher gathered and interpreted data about his interventions to produce evidence that the situation had changed as a result of his actions.

- Reflective teaching: the teacher-researcher collected various types of data about teaching and learning, examined his attitudes, assumptions and teaching practice, and used the information obtained as a basis for ongoing reflection, reflection-in-action, about teaching (Bailey, 2004: p.10-16).

- Taking the initiative: the teacher-researcher accepted the responsibility of acting and reflecting for himself, starting by focusing on his own practice within his own situation. This meant that he committed to evaluating his own work and initiating actions to improve it with a view to influencing his students as well. The teacher-researcher made his own decisions about what was worthwhile and what he should do, using his educational values as the basis for his action. In sum, the practitioner took the initiative and assumed responsibility for his own action.

The author perceives that the characteristics of the study at this preliminary stage, namely "problem-posing", "bringing change", "teacher as researcher", "reflective teaching" and "taking the initiative" are in accord with those of action research. Action research has been defined and developed in a number of different ways, so inevitably different people have different ideas about what action research is, but the characteristics identified have much in common (McNiff & Whitehead, 2006: p.7-9; Nunan, 1992: p.17-18; Kemmis & McTaggart, 1988: p.10-14). They are:

- **Problem-solving (Problem-posing) and bringing change**

Action research is more than problem-solving. It involves problem-posing, but does not start from a view of problems as pathologies. Action research is motivated by a quest to understand and improve the situation by changing it and learning how to improve it from the consequences of the changes made (Kemmis & McTaggart, 1988: p. 21-22; McNiff, Lomax & Whitehead, 2003: p.13).

- **Teacher as researcher and reflective practitioner**

Effective curriculum development depends on the capacity of teachers to take a research stance towards their teaching, that is, an inclination to examine one's own practice critically and systematically (Stenhouse, 1975: p.156). It is widely perceived by advocates of action research that teaching and research are closely related, taking as central the teacher as researcher (Elliott, 1991: p. 3-12; McNiff, Lomax & Whitehead, 2003: p.12).

"all well-founded curriculum research and development, whether the work of an individual teacher, of a school, of a group working in a teacher's center or a group working within the co-ordinating framework of a national project, is based on the study of classrooms. It thus rests on the work of teachers" (Stenhouse, 1975: p.143).

In action research, when teachers act as researchers collecting data in classrooms for the purpose of changing and improving classroom practice, it is closely related to teachers acting as reflective practitioners. The key point for being reflective practitioners is a capacity for reflecting-in-action (Schön, 1991: p.54; Chih-Hui, 2007). Schön indicates that the workaday life of a practitioner depends on tacit knowing-in-action. As a practice becomes more repetitive and routine, and as knowing-in-action becomes increasingly tacit and spontaneous, the practitioner may miss important opportunities to think about what he or she is doing. Therefore, a practitioner's reflection can serve as a corrective to such issues. Through reflection, the practitioner can:

"surface and criticize the tacit understandings that have grown up around the repetitive experiences of a specialized practice, and can make new sense of the situations of uncertainty or uniqueness when he may allow himself to experience" (Schön, 1991: p.61).

As teachers' practice in classrooms can lead to routine and repetition, the concept of reflection-in-action can be applied equally to an educational context. It is vitally important for teachers to develop reflection-in-action in order to achieve continuous improvement of their situations (McNiff, Lomax & Whitehead, 2003: p.13; Chih-Hui, 2007).

- **Insider research**

A felt need, on the part of a practitioner to initiate change, is a necessary precondition of action research. It is the feeling that some aspects of a practice need to be changed if its aims and values are to be more fully understood, which activates this form of inquiry and reflection (Elliott, 1991: p.53). In short, action research is always insider research, which means the researcher is inside the situation, and is willing to improve the status quo. Therefore, action research is research carried out by individuals with regard to their own situations; it is not research done by other people or on other people (Kemmis & McTaggart, 1988: p. 22; McNiff, Lomax & Whitehead, 2003: p.12-14).

Action researchers make their own decisions about what is important and what they should do, they then base the decisions for action on how they understand what is good, and how they think the situation should be. Because this is such an important responsibility they need to justify whether their influence is improving the situation and benefiting other people (McNiff, Lomax & Whitehead, 2003: p.15).

The previous sections clearly demonstrated that the characteristics of the pilot study meshed nicely with those of action research. This therefore was the chosen methodology. An experimental approach was not appropriate because it would have been difficult to control the variables and there would have been practical problems changing the curriculum for one group. As the study had evolved its own style of inquiry, the concept and process of a self-reflective spiral in action research had gradually affected the way the researcher approached his project. The researcher felt the need for a more rigorous approach comprising a set of planned activities that should be integrated into the subsequent study. It is therefore necessary to take into account Kemmis and McTaggart's views (1988: p.10) that to do action research is to plan, act, observe and reflect more carefully, more systematically, and more rigorously than a teacher does in daily practice, and using the relationships between these 'moments' in the process as a source of both improvement and knowledge. They emphasize that action research is a dynamic process in which these four moments or phases are not perceived as static steps, complete in themselves, but rather as moments in cycles of planning, action, observation and reflection. These phases are described in their relation to this research project as follows (ibid, p.10-14):

At the moment of *planning*, a general plan is constructed and by definition must be prospective to action. As the plan is going to be put into action in a particular context,

it must be flexible enough to adapt to unexpected effects and previously unrecognized constraints (ibid, p.11). Referring to this research project, the planning phase involved "problem-posing" and "taking the initiative", through which a new and detailed teaching programme was formulated to address the aforementioned technique-led problem.

Action in a general sense is deliberate and controlled; it is a careful and thoughtful variation of practice. Action at this phase is guided by planning in the sense that it looks back to planning, but is not completely controlled by the plan. Therefore, action should be fluid and dynamic, requiring instant decisions about what is to be done, and the exercise of practical judgment (ibid, p.12). Concerning this research project, the action phase involved "taking the initiative" and "bringing change", through which the teacher integrated Gestalt theory into his curriculum as an alternative approach to teaching photography.

The distinguishing feature of action research is that it is always observed. The strength of *observation* lies in the fact that it can provide the basis for immediate and subsequent reflection. Careful observation is necessary, through which action limited by constraints of reality are observed and realized (Chih-hui, 2007: Ch5). Action researchers need to be responsive, open-eyed and open-minded in order to observe the action process, the effects of action, and the circumstances of and constrains on action (Kemmis & McTaggart, 1988: p.13). In this research project, the observation phase involved adopting a "teacher as researcher" perspective, within which the teacher carefully observed the changes in student performance through approaches such as evaluations of student portfolios, interviews with students, observations of student presentations and the keeping of a teaching journal.

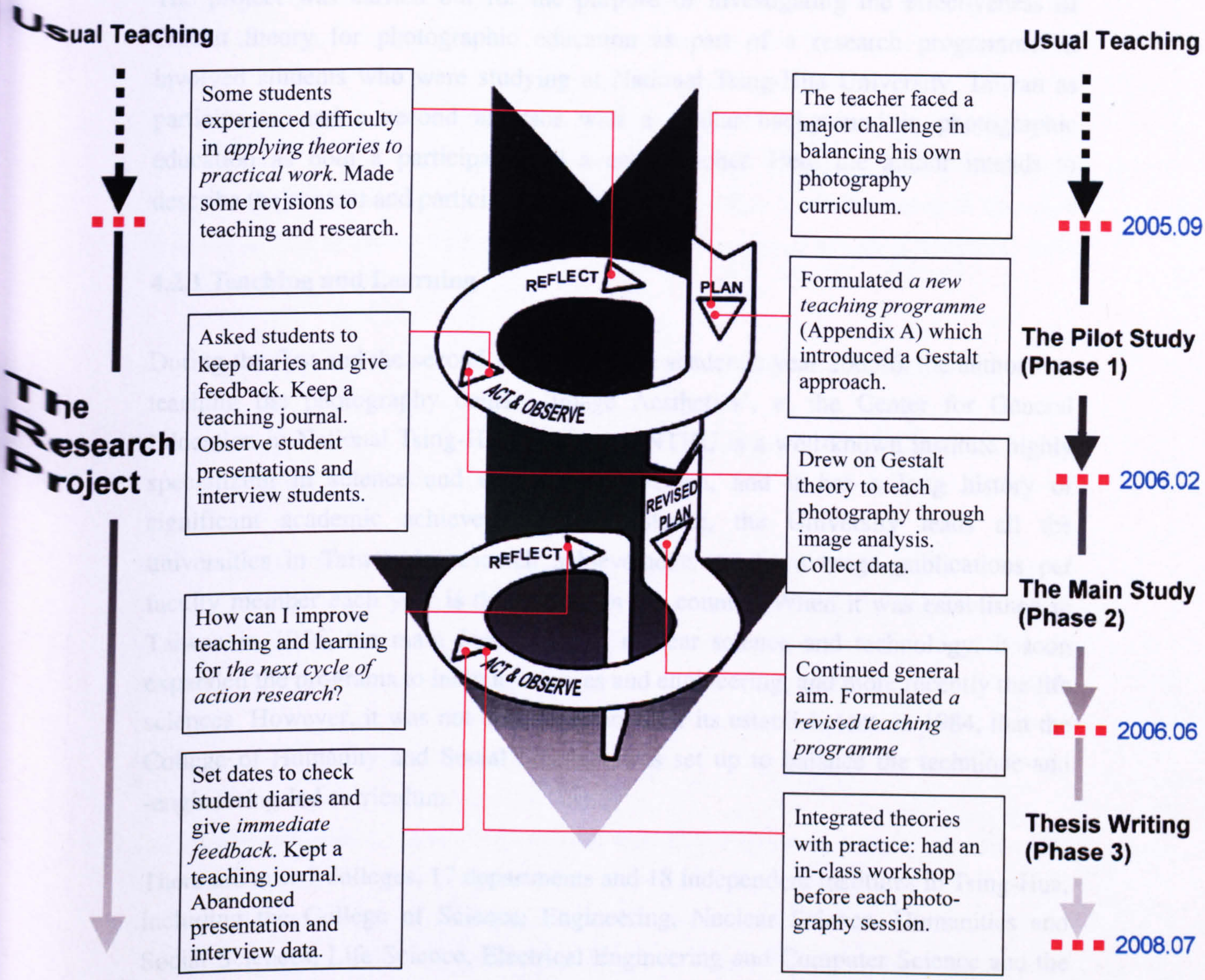
The *reflection* phase seeks to make sense of processes, problems, issues and constraints made manifest in strategic action. It is in one sense descriptive, allowing reconnaissance of the purpose of building a more vivid picture of life and work in the situation and constraints on action. Furthermore, reflection also has an evaluative aspect in which it asks action researchers to judge whether effects of informed action were desirable, and whether they provide the basis for a revised plan (ibid, p.13). Referring to this research study, the reflection phase involved adopting the perspectives of "teacher as researcher" and "reflective teaching". Through ongoing reflection, the teacher-researcher made revisions to his teaching practice and research project, which formed a revised teaching programme for the next cycle of an action research spiral.

The self-contained cycles of planning, action, observation and reflection in an action research spiral form the basic framework of this research project, which is graphically illustrated in figure 4.1. However, Kemmis and Wilkinson (1998: p.21) remind us that in reality the process may not be as neat as this spiral of self-reflective cycles suggests. The phases overlap, and initial plans immediately become obsolete because of learning from experience. In real contexts the process is likely to be more fluid, open and responsive.

"The criterion of success is not whether participants have followed the steps faithfully, but whether they have a strong and authentic sense of development and evolution in their practices, their understanding of their practices, and the situations in which they practice" (ibid, p.21).

What makes action research different from usual teaching practice is that teachers as researchers have to provide evidence to show how situations have changed because of their influence. Action research is more than problem-solving; it involves gathering and interpreting empirical data to justify informed actions. These procedures will be discussed in later sections (sections 4.4 & 4.5).

Figure 4.1 The framework of this research project with a time frame – an individual aspect in action research (modified from Kemmis and McTaggart, 1988: p.14)



- The pilot study was carried out during the first semester of the academic year 2005-6, which started in September 2005 and ended in February 2006.

- The main study was carried out during the second semester of the academic year 2005-6, namely the target semester of the project, which started in February 2006 and ended in June 2006.

4.2 Research Contexts

The project was carried out for the purpose of investigating the effectiveness of Gestalt theory for photographic education as part of a research programme. It involved students who were studying at National Tsing-Hua University, Taiwan as participants, and a 'second assessor with a similar background in photographic education as both a participant and a co-researcher. Here the author intends to describe the context and participants of the project.

4.2.1 Teaching and Learning

During the first and the second semester of the academic year 2005-6, the author was teaching the photography course 'Image Aesthetics', at the Center for General Education in National Tsing-Hua University. NTHU is a well-known institute highly specializing in science and engineering research, and it has a long history of significant academic achievement. For instance, the University leads all the universities in Taiwan in research achievements as the average publications per faculty member each year is the highest in the country. When it was established in Taiwan in 1956, the main focus was on nuclear science and technology. It soon expanded the programs to include sciences and engineering, and more recently the life sciences. However, it was not until 28 years after its establishment, in 1984, that the College of Humanity and Social Sciences was set up to balance the technique-and -engineering-led curriculum.

There are now 7 colleges, 17 departments and 18 independent institutes in Tsing-Hua, including the College of Science, Engineering, Nuclear Science, Humanities and Social Sciences, Life Science, Electrical Engineering and Computer Science and the College of Technology Management. Moreover, the Center for General Education is charged with supervising the common distribution curricula for the entire university. 'Image Aesthetics', the subject with which this research is concerned, was the course taught by the author at the Center. It was included as a selective course within the Art Appreciation dimension, one of the seven dimensions of the core curriculum. It had always been the only photography course at the university. This is relatively unusual for an institute of nearly 8500 students and for such a popular subject.

The teacher perceived photography not only as a method of recording or a tool of communication (e.g. BTEC guidebook), but also as a powerful medium for self-expression or artistic creation as a number of other visual art forms.

Given the importance of photography, it is reasonable to suggest that not only should photography students engage with it as a means to produce imaginative work; they should also be educated to appreciate their own work and the work of others. As the author mentioned in section 4.1, the classroom practice he had was imbalanced, giving too much weight to the productive process of photography, while the appreciative aspect was often overlooked. Therefore, at the beginning of the academic year 2005-6, a new teaching programme integrating image analysis with Gestalt theory was formulated to balance and improve the status quo[1]. By means of thorough training in Gestalt theory and photographic skills, the overall teaching objectives were that students should be able to:

- apply multiple Gestalt concepts and photographic skills flexibly to produce effective, imaginative images.
- analyse and critique self-produced images rigorously in terms of a wide range of Gestalt concepts.

The objectives were directly linked to the primary purposes of this study, which is to develop and evaluate students' ability to produce and appreciate photographs. In this research context, the appreciation of images was defined as the ability to analyze and critique photographs using Gestalt theory.

4.2.2 A New and Revised Teaching Programme

As shown in figure 4.1, a new and revised teaching programme was formulated at the beginning of the target semester in February 2006. It comprised a syllabus for the course, the format of the course unit, teaching methods, an account of the close link between learning and assessment, a learning diary study and a scoring rubric, which are delineated as follows (see Appendix B for detailed information):

- **Syllabus for the course**

This section contains the structure and content, the syllabus, of 'Image Aesthetics'. The course was offered twice in the academic year 2005-6; one for the first semester and one for the second semester. Each semester in general covered 18 weeks of classes, and each class lasted three hours. The course was divided into 12 connected units; some units took more teaching hours than the others. Below is the syllabus for 'Image Aesthetics':

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[1] This refers to the pilot stage in this research context.

Unit/Time		Course Content	
1st unit	1st week	Introduction to the course.	
2nd unit	2nd week	Visual selection: *figure* and *ground*; workshop.	
3rd unit	3rd week	1st photography session: Coursework, an electronic portfolio.	
4th unit	4th week	Gestalt Grouping; Diary inspection date (5th week).	
	5th week		
	6th week		
5th unit	7th week	Memory and association; workshop.	
6th unit	8th week	Midterm presentation.	
	9th week		
7th unit	10th week	2nd photography session: Coursework, an electronic portfolio; Diary inspection date.	
8th unit	11th week	Space, time and color.	
	12th week		
9th unit	13th week	Contours; workshop (14th week).	Art psychology session: Balance.
	14th week		Art psychology session: Balance.
10th unit	15th week	3rd photography session: Coursework, an electronic portfolio; Diary inspection date.	
11th unit	16th week	Illusion and Ambiguity.	Art psychology session: Simplicity.
	17th week		Art psychology session: Past experience.
12th unit	18th week	Term project: an electronic portfolio; Submission of learning diary.	
Textbooks		• Arnheim, R. (1974) Art and Visual Perception. University of California Press. • Gombrich, E. H. (1998) The Story of Art. • Zakia, R. D. (2002) Perception and Imaging, 2nd edition. Focal Press.	

Table 4.2 A structured syllabus for 'Image Aesthetics'.

- **Unit format**

In the teaching programme, each course unit was set out in the following way.

Description of unit: A brief description of the course content of the unit was given, together with the key areas of study associated with the unit.

Teaching objectives (expected learning outcomes) and assessment criteria: each unit contained the statements of the objectives that each student was expected to achieve against certain criteria. The relevant information about textbook, materials and coursework was also included (see table 4.3 for an example).

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the concept of figure and ground, using examples from graphic design, psychology, photography, and works of art.	• apply the concept of figure and ground, such as figure-ground enhancement, to analyze or produce images.
Textbook: Chapter 1 of Imaging and Perception (Zakia, 1999). **Material:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Table 4.3

- **Teaching methods**

The concept of Gestalt grouping of visual elements was at the core of the curriculum. Units of the course were closely related to each other, forming a coherent whole. Each class consisted of two main sections: the teacher's lecture and the students' group discussions, and the time ratio of lecture to discussion was approximately four to one. The teacher played a leading role in the first section of a class, imparting skills and knowledge to his students by offering a range of rich visual experiences, using Microsoft PowerPoint slide shows and Flash animations instead of printed materials. The second part was the group discussion. The students formed groups, usually 3 to 6

students in a group, to discuss course content or questions raised by the teacher. During the discussion, the teacher participated in each group and offered useful feedback. It was hoped that the feedback could provide the students with some food for thought. Before finishing the class, the teacher randomly selected students from several groups (one student from each group) to present their learning outcomes. The foregoing process is revealed in table 4.4.

Teacher's Lecture (80%)	The teacher played a leading role in the first section, imparting skills and knowledge to his students by offering a range of rich visual experiences, e.g. using Microsoft PowerPoint slide shows and Flash animations instead of printed materials.	
Group Discussion (20%)	**Discussion**	The students formed groups, usually 3 to 6 students in a group, to discuss course content or questions raised by the teacher. During the discussion, the teacher participated in each group and offered useful advice.
	Presentation	Before finishing the class, the teacher randomly selected students from several groups (one student from each group) to present their learning outcomes.

Table 4.4 The structure of a 3-hour class.

- **Learning and assessment**

As seen in table 4.3, each course unit contained expected learning outcomes and related criteria for assessment. These criteria were used to measure the effectiveness of student learning. They were expected to be used in conjunction with the criteria of other units to assess student performances in their work.

To gain a thorough understanding of students' progress in the productive and appreciative domains of photography, two types of assessment task were devised: *coursework and a term project* in the form of a portfolio and *a formal presentation* (see table 4.2).

The first focus was the *portfolio*, which was in electronic format, including at least 20 photographs, and each photograph was accompanied by a self-evaluative essay. In addition, technical information such as aperture, shutter speed, ISO and date was required to be included. In terms of the supporting essay, students were expected to apply what they had learned in the course, primarily Gestalt theory, to analyze and critique their own images. The portfolio design was intended to help the teacher diagnose student needs and encourage students to take responsibility for the selection of and reflection on their own work. When compared and contrasted with previous teaching programmes, it was clear that the new design gave greater attention to the formative use of assessment (Black & William, 1998b). The differences and similarities are listed in table 4.5.

Lesson Plans **Assessment Task**	**Old teaching programmes** (prior to Sep 2005)	**New teaching programmes** (Sep 2005 hereafter)
Portfolio: Coursework Term project	• No coursework, therefore no feedback. • Each photograph in a portfolio is supported by a self-evaluative essay.	• Submit coursework 3 times in a semester; give feedback on each task. • Each photograph in a portfolio is supported by a self-evaluative essay.
Presentation: Midterm presentation	• Presentation only.	• Presentation with interview/talk.

Table 4.5 A comparison of the old and new teaching programmes.

The second focus for assessment was the *midterm presentation*. While giving a presentation, each student had 6 to 8 minutes to present learning outcomes. The chosen topic had to be closely related to the curriculum content. After the performance, each student was required to undergo a brief interview/talk with the teacher and submit an electronic file of his or her presentation. Again, the follow-up interview was an effort by the teacher to strengthen formative assessment. The criteria used for judging performance during the presentation were the same as that for the portfolio. This may not have been entirely appropriate since the presentation was in the form of an oral exam which is quite different from that of a portfolio. Because of some practical difficulties in the assessment process (see section 4.3), the presentation data has been excluded from this project.

The teacher needed to apply the criteria holistically to judge all the works in a portfolio or presentation rather than to focus exclusively on a single or selection of photographs. When assessing student performance, the criteria were used as guidelines and reviewed on a regular basis. Therefore, the teacher's own intuitive and experiential understanding of student performance against certain criteria still played a very important role in the evaluation process (Dorn, Madeja & Sabol, 2004: p. 126, 170). Readers are referred to Appendix A and section 4.4 for a detailed description of the structure of a student portfolio.

- **A learning diary**

The teacher invited student volunteers to participate in a diary study in order to gain insight into their photography learning experiences, and also to address the subsidiary research question: "What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory?" In the diaries, learners were free to express their thoughts and feelings about Gestalt theory and individual learning experiences in or after class on a regular basis. However, the teacher provided a few guidelines as hints as to how they might proceed (see table 4.6). A more detailed account of the learning diary is presented in section 4.4.

The Learning Diary for 'Image Aesthetics'

1st week

Name:	**Department and Year:**	**Course content:**

Hints: What have I learned in this week? Are the lectures easily understood? Are the visual teaching materials easy to absorb? Is there anything the teacher should add to the curriculum? What have I learned in the photography sessions? Are there enough photography sessions for me? Have I experienced any difficulties with theoretical concepts? How can I apply theoretical concepts to practical work? *These are provided only as guidelines; you are very welcome to provide your own reflections on the course.*

Table 4.6 A sample page (shortened) of the learning diary.

- **A scoring rubric**

The primary purpose of developing the curriculum-oriented assessment criteria for the course units was to strengthen the links between the teaching and assessment. In order to reduce teacher workload and increase the effectiveness of the evaluation and scoring process, an analytical scoring rubric was devised to help the teacher to assess and score student work (see table 4.7). The assessment criteria in the 12 course units were grouped into 3 dimensions, namely Photographic Technique, Theory Analysis, and Theory Application. Therefore, in the evaluation process the domain of assessment was divided into these dimensions, and each dimension was further divided into five hierarchical levels of performance.

Table 4.7 An analytic scoring rubric.

First Dimension: Photographic Technique (refer to criteria in Unit 3, 7, 8) To what extent can the student apply photographic techniques (appropriate choice of aperture, shutter speed, white balance, and ISO) to produce photographs?		
Excellent	**4**	Assignment exhibits thorough understanding and application of photographic skills to produce imaginative work.
Very Good	**3**	Assignment exhibits a good ability to utilize photographic skills required for the subject matter.
Satisfactory	**2**	Assignment exhibits a certain amount of application of photographic skills, but some may not be appropriately related to the subject matter.
Inadequate	**1**	Assignment exhibits some errors in applying photographic skills.
No Response	**0**	Assignment exhibits no regard to application of photographic skills.
Score: _____		
Second Dimension: Theory Analysis (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11) To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to analyze photographs?		
Excellent	**4**	Assignment exhibits thorough understanding and application of multiple theories to perform a comprehensive analysis.
Very Good	**3**	Assignment exhibits a good ability to utilize relevant theories to perform an appropriate analysis.
Satisfactory	**2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate	**1**	Assignment provides some descriptive accounts of theories which are not relevant to the work.
No Response	**0**	Assignment does not utilize theories to analyze photographs.
Score: _____		

Third Dimension: Theory Application (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11) To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to produce photographs?	
Excellent **4**	Assignment exhibits thorough understanding and application of multiple theories to produce imaginative work.
Very Good **3**	Assignment exhibits a good ability to utilize relevant theories required for the subject matter.
Satisfactory **2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate **1**	Assignment exhibits some unsuccessful attempts to apply theories because of misunderstanding.
No Response **0**	Assignment exhibits no regard to application of theories.
Score: _____	

While assessing a student's assignment, the teacher was expected to apply all the criteria per dimension holistically, judging all works as a whole and giving a score for each dimension. The reasons for adopting the analytical scoring rubric were:

- The great virtue of analytic scoring is its diagnostic capability, because it can provide students and the teacher with useful feedback along each dimension. On the other hand, a single score for all aspects of a student's work (holistic scoring) does not reflect the quality of the product (Armstrong, 1994: p.149). The scoring rubric in table 4.7 as a whole was to some extent a hybrid of the two types, since the teacher also had to assign an overall or integrated score to each assignment for statistical purposes, and also in order to fulfill university regulations.

- There were issues concerning the reliability of the assessment of student work. The same student portfolio was evaluated and scored independently by the teacher and a second assessor with a similar background in photographic education. Because the rubric descriptors offered the assessors explicit scoring standards, it was very helpful in ensuring consistency between the raters, that is, inter-rater reliability (Dorn, Madeja & Sabol, 2004: p. 118-120).

Moreover, the relationship between the overall teaching objectives (see section 4.2.1) and assessment dimensions is shown in table 4.8. In this research, the phrases 'analytical aspect' and 'appreciative aspect' are interchangeable.

Teaching Objective:		Assessment Dimension: Dimension(s) related to the teaching objective
Productive Aspect	Students should be able to apply multiple Gestalt concepts and photographic skills flexibly to produce effective, imaginative images.	● Photographic Technique ● Theory Application
Appreciative (Analytical) Aspect	Students should be able to analyse and critique self-produced images rigorously in terms of a wide range of Gestalt concepts.	● Theory Analysis

Table 4.8

4.2.3 Research Participants

In this section the author will describe all the participants in the main study separately; they are the teacher, the students and the second assessor.

- **The teacher**

The teacher graduated in physics from National Tsing-Hua University in 1986. After two years of compulsory military service, he had worked as a system engineer for a computer company until 1991. Later on he started a new career as a freelance wildlife photographer after taking a particular interest in bird-watching and nature. In 1998 he gave up this career to pursue an MA in photography at London University for the purpose of applying for a position in a university in Taiwan. In the year 2000, the author started to teach academic courses in photography at a private university. In March 2003, he began to give lectures on photography at NTHU.

During the main study of the research project, the author was teaching part-time at the Center for General Education in the University. He taught the same course twice a week on Monday and Tuesday, and each lasted three hours. There were 26 students in the Monday class, 32 students in the Tuesday class.

- **The students**

Theoretically speaking, all the students who attended the course, i.e. 58 students in total, were among the participants in this research project. However, because the diary study (4.2.2) was to be a major source of data, the researcher decided at that point to focus his data collection and analysis on the students who volunteered to be part of the diary study and who eventually submitted their diaries. At the beginning of the target semester, there were a total of 26 students who were willing to take part in the diary study. The number of participants reduced as the research project evolved, and at the end of the semester there were only 21 students still involved. Intense examination pressure might well have been the reason why 5 students gave up during the semester. The composition of the 21 volunteer diarists in terms of their genders and backgrounds is shown in table 4.9.

The student volunteers did not necessarily comprise a representative sample of all the students. They were not selected at random, nor were they selected based on the known attributes of the 58 students. A principal reason for this was that a willingness to participate was considered essential on ethical grounds. This, however, inevitably had an impact on the representativeness of the students in the classes. The volunteers might be expected to be more confident and willing to express opinions than the 'average', with the reserved and shy students being overlooked (Denscombe, 2000: p.361-362).

All the students' names had been changed to code names to preserve their anonymity. A code name was composed of one letter and three digits. The letter, either M or F, stood for the student's gender (male or female), followed by the last three digits of his or her student ID number. Moreover, the composition of the participating group was roughly representative of the population distribution of students at NTHU in terms of the ratio of males to females and students of science background to humanities background.

Student		Gender		Background	
No	**Code Name**	**Male**	**Female**	**Science**	**Humanities**
1	F018		Female	Science	
2	F533		Female	Science	
3	M009	Male		Science	
4	F115		Female		Humanities
5	M005	Male		Science	
6	M632	Male		Science	
7	F042		Female	Science	
8	F214		Female		Humanities
9	F233		Female		Humanities
10	F371		Female	Science	
11	F937		Female		Humanities
12	M048	Male		Science	
13	M316	Male		Science	
14	M332	Male		Science	
15	M402	Male		Science	
16	M509	Male		Science	
17	M520	Male		Science	
18	M573	Male		Science	
19	M610	Male		Science	
20	M616	Male		Science	
21	M641	Male		Science	
Total		**13 (21)**	**8 (21)**	**17 (21)**	**4 (21)**
Percentage		**61.9%**	**38.1%**	**81.0%**	**19.0%**

- All students' names have been changed to preserve their anonymity.
- Science background refers to students in the College of Science, Engineering, Nuclear Science, Life Science, Electrical Engineering and Computer Science and the College of Technology Management.
- Humanities background refers to students in the College of Humanities and Social Sciences.

Table 4.9 The composition of the participants.

- **The second assessor**

One of the major concerns of this study was to measure the effects of Gestalt experiences on student learning outcomes, focusing attention on the production and analysis of photographic images. The researcher needed to measure student progress in terms of both productive and analytical (appreciative) aspects, rather than final results, in order to provide evidence to justify the claim that image analysis can be helpful in improving students' learning in photography, that is, to answer the main research question:

Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography?

In order to build an accurate picture of student progress over the course of a semester, it seemed reasonable to compare the differences in student performance at the start and the end of the semester. Referring to the curriculum planning (table 4.2) and for practical reasons, the researcher decided it was fair to compare the differences in quality between a student's first portfolio and final portfolio. As scheduled in the syllabus, students were required to submit their first portfolios in the third week of a semester before Gestalt content was formally introduced. Performance at this early stage could be seen as their initial ability levels[2]. The final portfolios were submitted at the end of the semester, and these represented their final learning outcomes. Through comparisons between the first and final portfolios, the researcher was seeking to determine the extent to which the Gestalt training had influenced student performance in the above-mentioned aspects. However, he could not exclude the possibility that certain factors might have played a role in the learning process. For example, some students might have joined a photography club at the university, and this certainly would have had an impact on the validity of the researcher's assessment of student performance.

A fictitious example is provided to describe the assessment process. Readers are referred to table 4.10: the scoring results of student M873.

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[2] There is room for argument on this point. It was not possible to ask the students to submit portfolios at the beginning of the semester, because they were considering available options before deciding to enroll for the course, which meant the teacher did not know who would be his students until the third week when the deadline for course selection passed.

Scoring M873	Photographic Technique	Theory Analysis	Theory Application
First portfolio	0	1	0
Final portfolio	2	1	2

Table 4.10

As we can see from the table, the first portfolio of M873 scores 0, 1, 0 along the Photographic Technique, Theory Analysis and Theory Application dimensions, and the final portfolio scores 2, 1, 2 along these dimensions. If the assessment process of these portfolios is reliable and valid, thus the researcher can reasonably conclude that M873 has made good progress in the Skills and Application dimensions, while in the Analysis dimension there is no progress at all[3].

As mentioned at the beginning of this section, a primary aim of the research was to have a clear understanding of the extent to which the Gestalt experiences had had a positive impact on student performance in photography. Assessment of this performance that attained a high degree of validity and reliability would no doubt play a crucial role in addressing the main research question and the following subsidiary question: "Is image analysis effective in developing students' ability to appreciate and produce photographs?"

The validity of assessment can be enhanced by two factors. First, both the content covered and the cognitive or skill level of the assessment tasks should conform to a set of syllabus criteria (Black, 1998: p.42-43). Second, the tasks and purposes of assessment should directly relate to the curriculum activities and content, i.e. ecological validity (Black & William, 1998a: p.4-7). There was enough evidence to say that these had been carefully planned and carried out in this research project (see for example 4.2.2 A new teaching programme). Issues of validity will be further discussed in section 4.3 to 4.5.

As to the reliability of a teacher's assessment of student performance, it refers to "the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions" (Hammersley, 1992: p.67).

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[3] This is only an example. In this research project, the progress of the 21 students as a whole was assessed using a statistical method, that is, an Effect Size measure.

A teacher can examine the degree of objectivity and reliability of his scorings by comparing them with the judgments of another qualified assessor who independently scores the same student portfolio applying the same criteria. This allows the determination of inter-rater reliability. After the evaluation, if two assessors generally agree on the level of proficiency demonstrated, then they have evidence that the results reflected student proficiency (Stiggins, 2001: p.218-219). Therefore, during the research project, the researcher invited a second assessor, Huang, who was also a photography teacher, to examine the effectiveness of the scoring rubric, the assessment criteria and the reliability of the assessment process through joint evaluations of student portfolios and follow-up meetings.

Huang has been the head of the department of Information Communication at China University of Technology, Taiwan since the academic year 2005-6. He specializes in graphic design and photography, teaching photography courses such as 'Basic Photography' and 'Advanced Photography' at the said institute. Huang was recommended for this voluntary work by one of the teacher's colleagues at NTHU.

A time frame of the joint evaluations and follow-up meetings during the project is illustrated in figure 4.2.

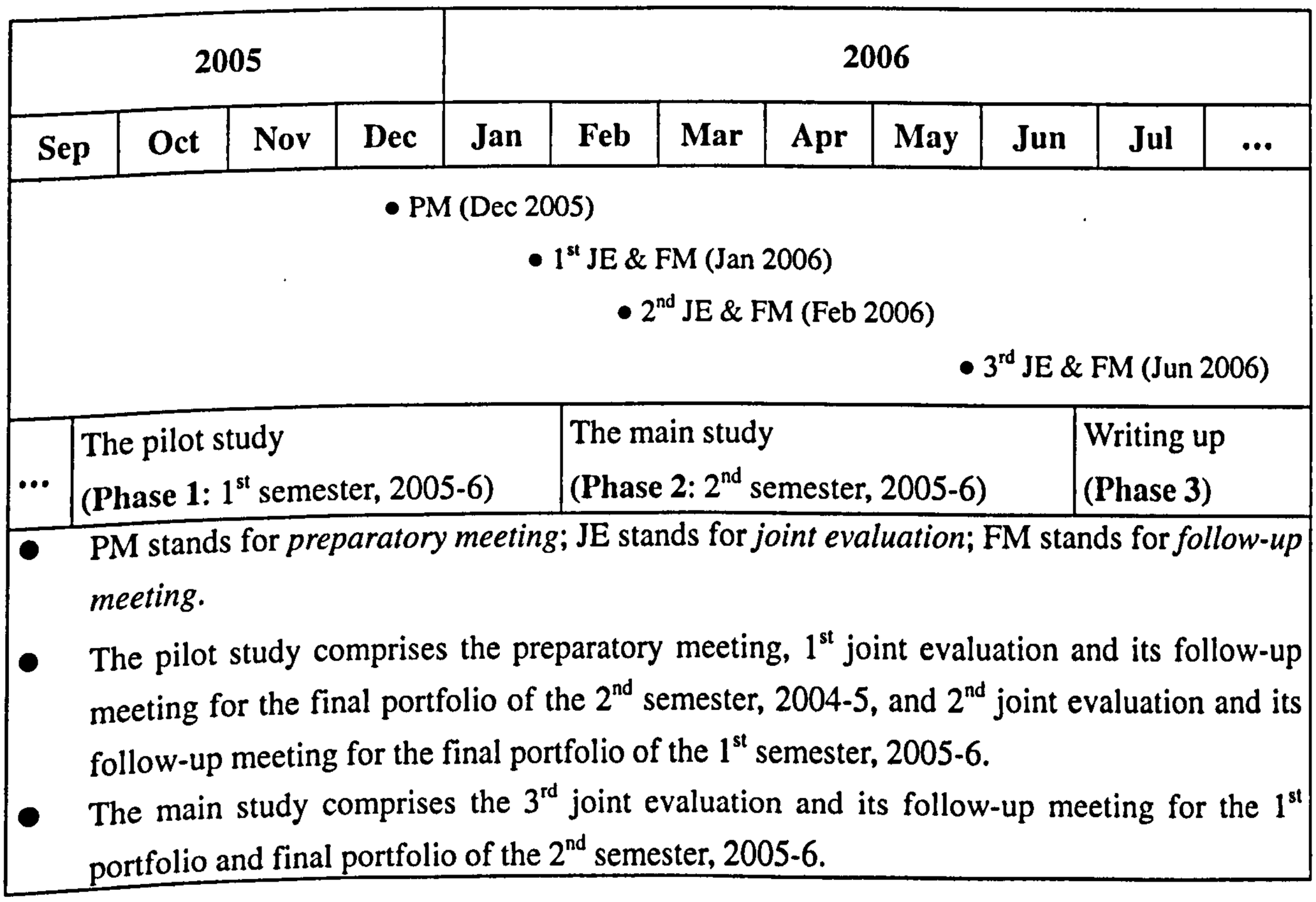


Figure 4.2

4.3 The Pilot Study

The pilot study was intended as an empirical investigation of the new teaching programme (see figure 4.1) and of the methods and procedures for collecting and analyzing data, evaluating their effectiveness for the next cycle of this action research project: the main study. The author has chosen to present data from the pilot study in this chapter rather than the data analysis chapter because it influenced the way he conducted the main study.

Fieldwork, data collection and analysis, in the pilot study was approximately the same as that in the main study, only on a smaller scale, with a sample size of 6 students. The pilot study lasted for 5 months, rather than a few weeks, during the first semester of the academic year 2005-6. Although the term 'pilot study' is used for this phase of the project, it is fair to say that this empirical test was more than a pilot study and indeed represented the first cycle of planning, action, observation and reflection in the action research spiral shown in figure 4.1.

The researcher intended to examine the following aspects in detail in relation to their appropriateness and effectiveness from different participant perspectives.

- The curriculum content
- The teacher's assessment of student performance
- The collection of data
- The analysis of data

4.3.1 Participants in the Pilot Study

Participants in the pilot study consisted of the teacher, student volunteers and the second assessor. At the time, the teacher invited the second assessor, Huang, for the purpose of ensuring the reliability and effectiveness of his assessment of student performance.

During the pilot stage, the teacher was teaching 'Image Aesthetics' at NTHU. He taught the course once a week on Tuesday afternoon, with a total of 35 students in the class. At the beginning of the semester, the teacher invited class members to be part of a diary study, and 11 students agreed to participate. In the end, only 6 students submitted their diaries. Since the diaries were to be a primary source of data, therefore, the researcher decided to focus his attention on the 6 volunteers, who were then

considered as the student participants in this pilot study. There were 3 females and 3 males; 4 students with a background in science, 2 in humanities (see table 4.11).

Involving co-participants at this stage enabled the researcher to get 3 different perspectives for the pilot study, namely the perspectives of the teacher, the students and the second assessor.

Student		Gender		Background	
No	**Code Name**	**Male**	**Female**	**Science**	**Humanities**
1	F609		Female	Science	
2	M910	Male			Humanities
3	F349		Female	Science	
4	F207		Female		Humanities
5	M012	Male		Science	
6	M146	Male		Science	
Total		**3**	**3**	**4**	**2**
Percentage		**50.0%**	**50.0%**	**66.7%**	**33.3%**

- All students' names have been coded to preserve their anonymity.

Table 4.11 The composition of the participants in the pilot study.

4.3.2 Procedures: Action and Research in the Pilot Study

During the pilot stage of the project, the researcher intended to gather all sorts of data to examine whether the collection of the data was technically feasible, and whether the data represented student learning outcomes and experiences which would be useful for the fieldwork in the main study.

As the author mentioned earlier, the pilot study represented a whole cycle of planning, action, observation and reflection in an action research spiral, carried out during the first semester of the academic year 2005-6, covering 18 weeks of classes. The empirical procedures in the pilot study will be described in the order in which they occurred during the semester.

- 1st week: the teacher introduced his students to the content of the course; he invited students to be part of a diary study, and 11 students agreed to participate.

The teacher decided to keep a teaching journal.

- 3rd week: the students submitted their coursework, namely the first portfolio.
- 8th week, 9th week: the students gave presentations and had follow-up interviews with the teacher; these activities were video and audio recorded.
- 10th week: the students submitted their coursework, namely the second portfolio, and also handed in their learning diaries for inspection. Only 10 students submitted their diaries.
- 11th week: the teacher gave each student some feedback on his or her diary.
- 15th week: the students submitted their coursework, i.e. the third portfolio.
- 17th week: the teacher and the second assessor jointly evaluated the final portfolios from last semester (2nd semester, 2004-5), and afterwards they discussed the results from the cooperative assessment in a follow-up meeting.
- 18th week (Tuesday): the students submitted their final portfolios and had follow-up interviews with the teacher; the interviews were audio recorded. Only 6 students handed in their diaries.
- 18th week (Saturday): the teacher and the second assessor carried out a joint evaluation of the final portfolios, and afterwards they discussed the results from the joint assessment in a follow-up meeting.

Until the date of the first joint evaluation (17th week), the teacher could not confirm who would submit their diaries, the criterion for deciding participants for this pilot study, and therefore he was not able to choose student portfolios for the assessment. Instead, he selected 6 student portfolios[4] from the last semester of the same course. They were deliberately selected to ensure that a relatively wide range of performance was covered. As for the second joint evaluation (18th week), the final portfolios of the 6 students who submitted their diaries were chosen for the test. It should be noted that not being able to select subjects with certainty was an inherent limitation of collecting data on a voluntary basis.

The chosen portfolios for the first and the second evaluations were not from the same students, which meant a comparison between them was not appropriate. Hence the cooperative assessments were used for the purpose of assessing inter-rater reliability and the effectiveness of assessment instruments. As a result of the difficulties, in the main study, the first and the final portfolios were evaluated at the same date a few days after the final week when the student participants had been confirmed.

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[4] Considering his heavy workload at the time, the second assessor suggested a maximum of 5 to 6 portfolios would be appropriate for the joint evaluation.

With respect to the collected data, the researcher had the coursework, learning diaries, presentation and interview recordings, and final portfolios from the student participants; the results of the joint evaluations and follow-up meetings from the teacher and the second assessor, and the teaching journal from the teacher.

4.3.3 Results of the Pilot Study

In this section, the author will present what he obtained from the 3 different sources in the pilot study. It starts with a report of the joint evaluations by the two assessors, followed by an analysis of the data from the students and finally a review of the teacher's journal.

4.3.3.1 A Report of the Joint Evaluations

As mentioned in 4.3.2, the teacher and the second assessor, hereafter referred to as Lu and Huang, conducted 2 joint evaluations in the pilot study, the first was carried out in January 2006 (see figure 4.3), the second in February 2006. Two hypotheses were proposed for statistical analysis of the data from the joint assessment in order to examine: (a) whether the teacher's scoring of the same students' work differed significantly from the independent scoring of the second assessor and (b) whether the criteria and rubric discriminated between the performances of students on a set of scales of 0 to 4 (table 4.7).



Figure 4.3

The results of the first joint evaluation are shown in tables 4.12 and 4.13.

Score	Student	M604	F535	M140	F645	M319	F129
Lu	Technique	3	1	1	2	4	3
	Analysis	3	2	1	2	4	4
	Application	3	1	1	2	4	3
Huang	Technique	1	0	0	1	3	2
	Analysis	3	1	0	2	3	3
	Application	2	0	0	1	3	3

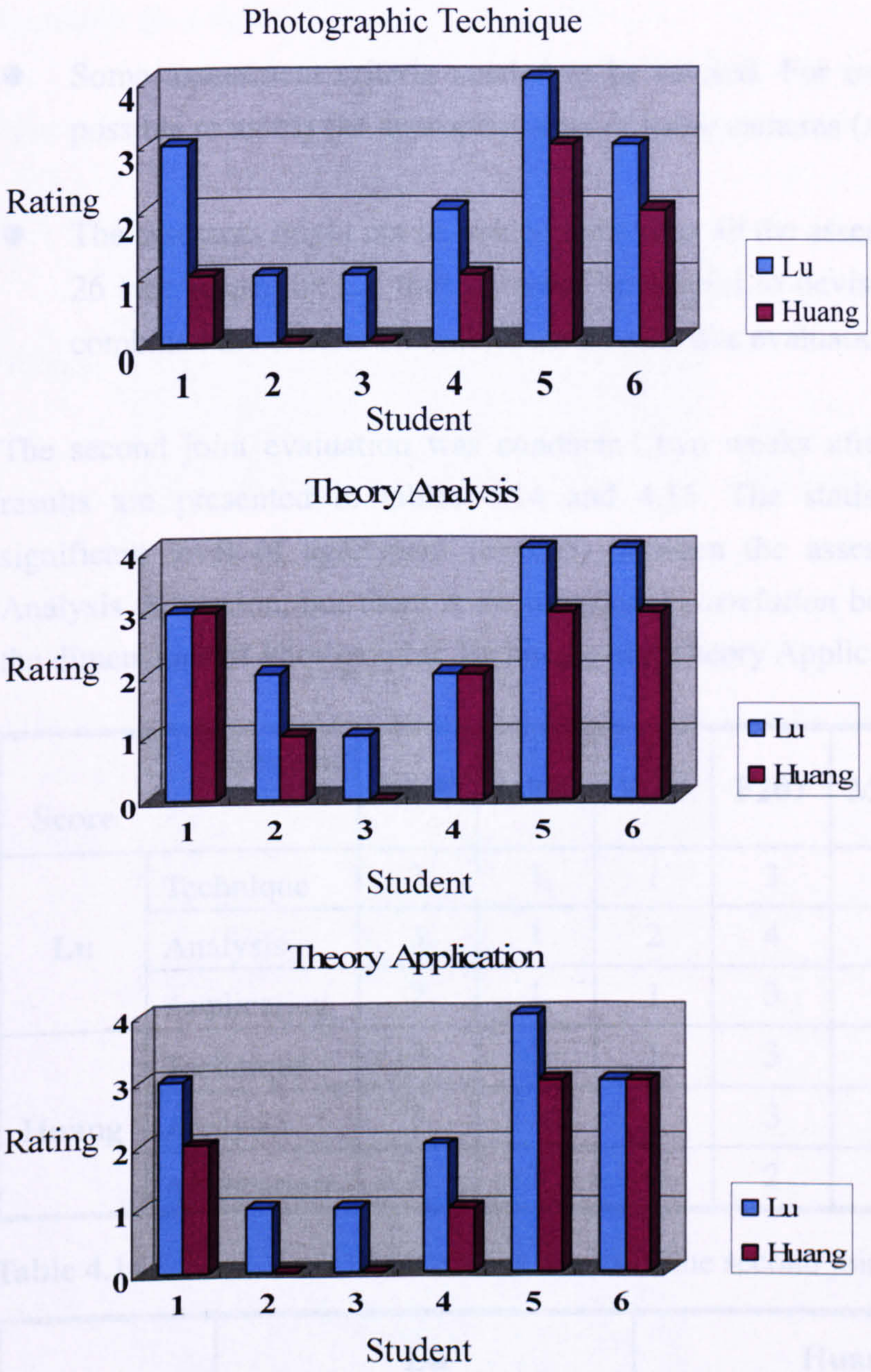
Table 4.12 Assessment results of the first joint evaluation.

Assessor / Score	Lu		Huang	
	frequency	percentage	frequency	percentage
0	0	0.0%	5	27.8%
1	5	27.8%	4	22.2%
2	4	22.2%	3	16.7%
3	5	27.8%	6	33.3%
4	4	22.2%	0	0.0%

Table 4.13 A score spread of the assessors.

A Spearman rho correlation was performed on the scores of the two assessors, along each dimension, in order to determine the relationships between their scores. The results showed a significant level of agreement (α=0.05) between the judges along all 3 dimensions. However, considering the assessors' scores along each dimension (see figure 4.4), they had similar patterns but at different levels, that is, Huang is consistently 'tougher' than Lu (purple is always lower than or equal to blue).

Figure 4.4



The results were congruent with literature (Dorn et al, 2004: p.118) which indicated that teachers scored their own students' work either somewhat higher or lower than independent assessors. A follow-up meeting was held immediately after the joint evaluation, and it was hoped that the ensuing dialogue between the judges would determine the cause of discrepancies in their scorings.

Huang recommended, in the meeting, that some revisions to the assessment instruments and procedures were needed to address the abovementioned problem.

- Instead of using numerical marks in the scoring rubric, he suggested using grades to assess student performance (Appendix A, table A7)[5].

- Some assessment criteria needed to be revised. For example, it might not be possible to assess the appropriateness of using cameras (Appendix A, Unit 3).

- The assessors might not be able to remember all the assessment criteria, a total of 26 (see Appendix C), thus it would be helpful to devise a scoring sheet which combined the criteria and rubric for an effective evaluation and scoring process.

The second joint evaluation was conducted two weeks after the first one, and its results are presented in tables 4.14 and 4.15. The statistical results showed a significant level of agreement (α=0.05) between the assessors along the Theory Analysis dimension, but there is *no significant correlation* between the judges along the dimensions of Photographic Technique and Theory Application.

Score	Student	F609	M910	F349	F207	M012	M146
Lu	Technique	3	1	1	3	3	2
	Analysis	3	1	2	4	3	2
	Application	2	1	1	3	3	1
Huang	Technique	3	2	1	3	1	1
	Analysis	3	1	1	3	2	2
	Application	2	1	0	2	1	1

Table 4.14 Assessment results of the second joint evaluation.

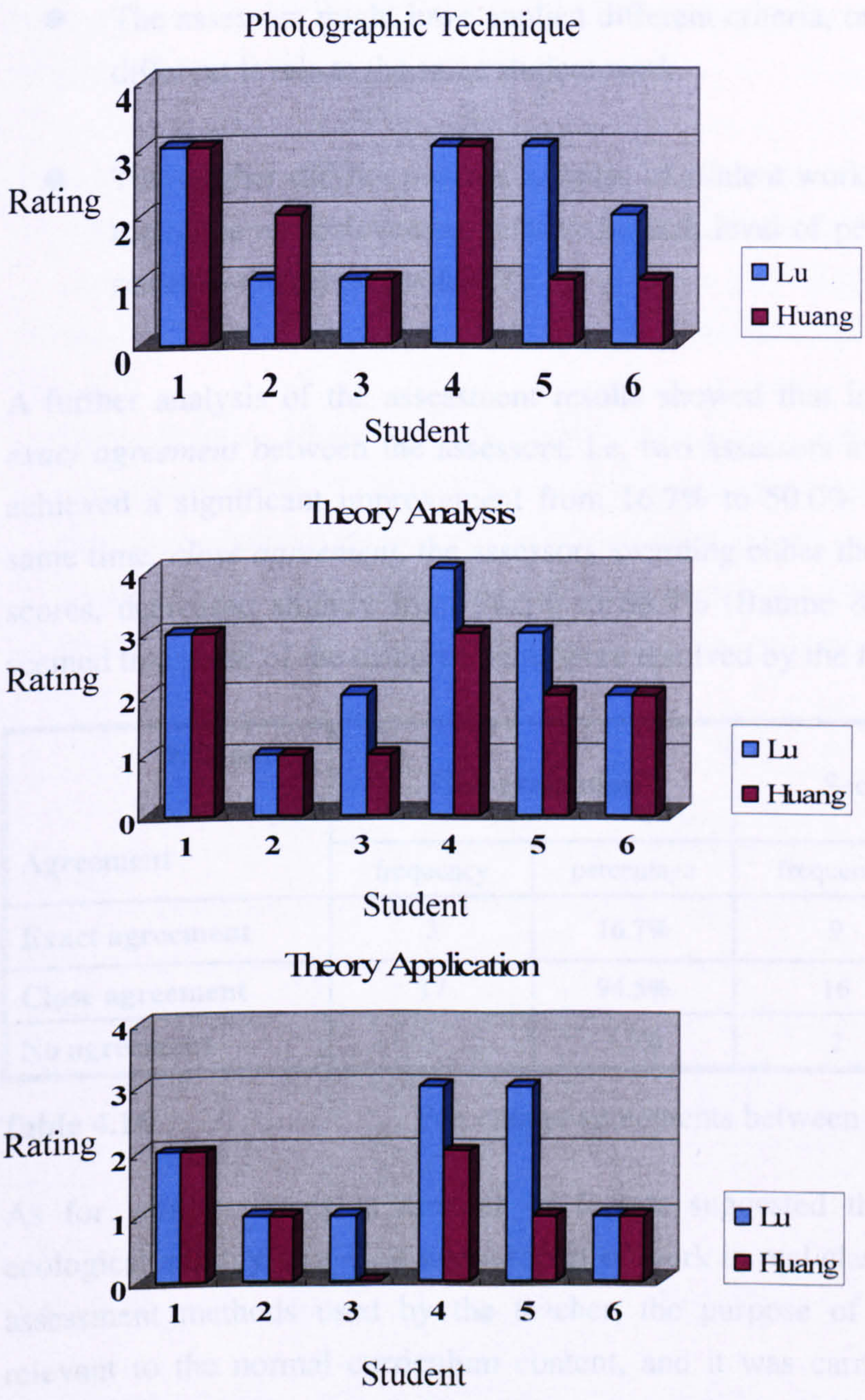
Assessor	Lu		Huang	
	frequency	percentage	frequency	percentage
0	0	0.0%	1	27.8%
1	6	33.3%	8	22.2%
2	4	22.2%	5	16.7%
3	7	38.9%	4	33.3%
4	1	5.6%	0	0.0%

Table 4.15

[5] The marks originally in table 4.12 were translated into grades on his advice and also for the convenience of statistical analysis.

Once again, Huang's scores were consistently lower than or equal to that of Lu, with the exception of the second student (M910) in the dimension of Photographic Technique (see figure 4.5).

Figure 4.5



A second follow-up meeting was held afterwards, addressing the problems that emerged in the second evaluation. The two assessors generally agree that there were several reasons which might explain why the discrepancies in their scorings had emerged.

- There were not enough samples (six only) for the test, thus any inconsistent appraisals of a single student portfolio would lead to the statistical failures. In this case, it was the score differences in the fifth student (M012) which caused the failures.

- The assessors might have applied different criteria, or the same criteria but at different levels to the same student work.

- The teacher did not provide samples of student work in advance to represent the range of achievement relative to each level of performance for the rating scales in the rubric (table 4.7).

A further analysis of the assessment results showed that in the second evaluation, *exact agreement* between the assessors, i.e. two assessors awarding the same score, achieved a significant improvement from 16.7% to 50.0% (see table 4.16). At the same time, *close agreement*, the assessors awarding either the same score or adjacent scores, decreased slightly from 94.5% to 88.9% (Baume & Yorke, 2002: p.14). It seemed that some of the disagreements were resolved by the first follow-up meeting.

Evaluation / **Agreement**	**First evaluation**		**Second evaluation**	
	frequency	percentage	frequency	percentage
Exact agreement	3	16.7%	9	50.0%
Close agreement	17	94.5%	16	88.9%
No agreement	1	5.5%	2	11.1%

Table 4.16 Percentage agreements between the two assessors.

As for *validity* issues, a number of factors suggested that the pilot study had ecological validity, that is, it was a report of work in real classroom about the normal assessment methods used by the teacher, the purpose of assessment was highly relevant to the normal curriculum content, and it was carried out by the students' usual teacher. The ecological validity of this study was especially important in determining the applicability of the results to the next stage of the project: the main study (Black & William, 1998a: p.10).

4.3.3.2 A Preliminary Analysis of the Data from the Students

In the pilot study, the researcher had the coursework, learning diaries, presentation and interview recordings, and final portfolios from the student participants. A preliminary analysis, namely close reading and examination of the data, revealed that the results carried a number of practical implications for the improvement of the teaching and the research. These are:

(1) In general, the students stated that they had learned a lot from this course. This echoed the results of the assessment of their portfolios[6]. The 6 students as a whole had made substantial progress in the Technique and Analysis dimensions, while in the Application dimension a certain progress had been achieved (table 4.17).

> "The teacher adopted an innovative approach, which integrated pictures, animations and texts, to explaining those not-so-interesting [Gestalt] theories, and that has helped me understand them easily. I think not only can these theories be applied to photography, but also to the design of posters or advertisements [her favorite subject]. ... This course is very meaningful to me" (diary, F609: Week 18).

Score / Student	Photographic Technique		Theory Analysis		Theory Application	
	first	final	first	final	first	final
F609	2	3	2	3	2	2
M910	1	1	0	1	1	1
F349	0	1	0	2	1	1
F207	2	3	1	4	1	3
M012	3	3	1	3	2	3
M146	0	2	0	2	1	1

Table 4.17 first: first portfolio; final: final portfolio.

(2) Several students expressed that they enjoyed very much the relaxed and interactive atmosphere of the group discussion, which allowed group members to exchange ideas and share their views. However, one of them (the one who later dropped out the diary study) also indicated that sometimes there was not enough time for her to think and then talk things out in the discussions.

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[6] Scoring of the first portfolios for the 6 students was not part of the pilot study, but it was added for the purpose of comparison with their final portfolios.

"The time for the group discussion was far too short, and we had not started to discuss some of the suggested topics when the class was finished" (diary, dropped out student: Week 5).

(3) Some students indicated that informal (extracurricular) consultations[7] were very helpful both in discussing one's own photographs with the teacher and in understanding the discussions between the teacher and other students. One student further emphasized the importance of the consultation by stating that:

"I have a feeling that I have developed the ability to analyze photographs [using Gestalt theory] entirely from my consultations with the teacher" (diary, F609: Week 14).

(4) During a photography session (table 4.2), the teacher explained to his students, through discussion group sessions, the nature of the task and how to complete it. Since these activities were conducted in sequence, a few students complained that they did not know what to do and how to do it before it was their turn to have the teacher's attention.

"Since we were in the final group, it took the teacher a long time before he finally got round to us and the class was about to end. Listening to his introduction [to today's course content and task], to my surprise, it turned out that there was no need to turn on the flash [on a cloudy day]" (diary, F349: Week 3).

4.3.3.3 A Review of the Teaching Journal

In this section the author will report the results of a careful examination of his teaching journal, focusing on several problems that emerged during the pilot study.

Most of the students in the class were novice photographers, which meant that they lacked some basic skills to express intention in photographs. For example, the intention to strengthen the *figure and ground* relationship in a photograph could not be fulfilled because of technique problems such as lack of correct focus or underexposure.

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[7] During the pilot study, the teacher provided a number of extracurricular consultations, usually carried out on Tuesday nights or Friday afternoons, in which students were free to discuss their problems relating to the course content, presentations or assignments with the teacher.

The response rate of the learning diary was relatively low compared to similar studies (see for example, Norton, 2000: p.26-27), and entries were brief and intermittent. As mentioned in 4.3.2, the teacher invited student volunteers to be part of the diary study. In the beginning 11 out of 35 students were willing to participate, and by the middle of the semester 10 students submitted their diaries; however, only 6 students (17.1%) handed in their diaries in the final week. Although intense examination pressure might well have been the reason for withdrawal, the teacher-researcher perceived that lack of feedback on their work during the semester and the fact that feedback was not provided immediately were the major reasons accounting for the low submission rate.

The assessment process was not entirely transparent to the students. The students in the class scored 'Assessment Methods' the lowest among a total of 15 items in a course evaluation programme conducted by the university. This phenomenon was not at all surprising, as this item had been scored the lowest for the same course over the past 3 years.

The teacher-researcher had difficulty in observing and assessing the students' performance during the midterm presentations and at the same time keeping records of those activities and follow-up interviews during and after the presentations, particularly as he also needed to provide immediate feedback on their tasks.

The interviews conducted in the presentation weeks and final week had to take place within a single three-hour class, and this time constraint meant that each student could only have about 2 to 3 minutes to think and talk about his or her ideas. Obviously, the students were unable to make their views clear in such a short period of time. Therefore, several students attempted to answer those interview questions in detail in their learning diaries. From the researcher's point of view, the interview data and the diary data to some extent overlapped. However, the latter was a more detailed account than the former.

The key issue of the assessment of portfolios was that in the portfolio each photograph had to be supported by a self-reflective essay. This would disadvantage students who could perform very well in taking pictures but did not have sufficient writing skills to write an essay reflecting on their abilities. In fact, the results of the pilot study showed that this was a rare occurrence: only one (F207) out of the 6 student participants claimed, in her final interview, that she had experienced writing difficulties.

4.3.4 Implications for the Main Study

One of the ways in which action research differs from action and research in usual situations is that it is always observed. Observations, such as those in section 4.3.3, had the function of documenting the effects of informed action, providing the basis for reflection at the time and in the immediate future. Reflection was not only descriptive, it asked action researchers to judge whether effects of the informed action were desirable, and suggested ways of proceeding which served as the basis for a revised plan (Kemmis & McTaggart, 1988: p.12-13). Therefore, on the basis of the observations and reflections on the pilot study, the teacher-researcher made several revisions to the teaching programme, the procedures for collecting data, and the assessment instruments and procedures. The revisions to each of the 3 aspects will be described in detail in the following sections (4.3.4.1 to 4.3.4.3).

4.3.4.1 Revisions to the Teaching Programme

The teacher made several changes to the teaching programme based on the issues discussed in section 4.3.3.

- Instead of taking place after the teacher's lecture (see table 4.4), the group discussion was set to start at a fixed time to ensure it accounted for about 20% of a three-hour class.

- The extracurricular consultations were re-scheduled to take place at a fixed time in a fixed place, that is, every Tuesday night at 7 pm to 9 pm in the university library.

- The teacher decided to provide a one-hour workshop a week before each photography session, aiming to help his students access course content and practise relevant photographic techniques in advance. These workshops were offered in response to the problem of a mismatch between the intention to express something in a photograph and the result.

Readers are referred to Appendix B for further information about the revised teaching programme.

4.3.4.2 Changes in the Procedures for Collecting Data

The researcher made several changes to the data collection procedures in this study in order to improve their effectiveness.

- The teacher decided to model the process of preparing a portfolio by analyzing and evaluating some of his own works in advance, demonstrating the analytical procedures for each photograph with a writing template.

- In view of the technical difficulties, time constraints and a lack of appropriate assessment instruments (described in 4.3.3), the presentation data was excluded from this project.

- Informal talks were substituted for follow-up interviews in the presentation weeks and final week due to technical difficulties, time constraints and the considerable overlap between the interview data and the diary data. The interview data was also excluded from the project.

- Since the interview data was excluded, the learning diary was to play a more important role in this research project. Therefore, the teacher-researcher made two major changes to the diary study. First, the format of the written diary was changed into an electronic one to ensure that immediate feedback could be given. Second, the teacher set 3 inspection dates — the 5^{th}, 10^{th} and 15^{th} week in a semester, at which times students were required to submit their diaries through emails, and would receive responses from the teacher electronically within a few hours. The main purposes of the changes were to provide students with detailed and immediate feedback on a regular basis, and increase the response rate of the learning diary.

The concept of feedback and that of formative assessment, the core of the teaching and learning in the project, overlap strongly, and the efficiency and quality of the feedback are two key features in any procedure for formative assessment. Feedback can help a learner realize the gap between the actual level and the reference level of his or her knowledge, understanding and skills and guide the learner through the actions necessary to close that gap (Black & William, 1998a: p.14; Ramaprasad, 1983: p.4).

4.3.4.3 Revisions to the Assessment Instruments and Procedures

According to the results of the joint evaluations and follow-up meetings, the teacher-researcher made several revisions to the assessment of portfolios.

- A number of assessment criteria were revised and made clearer with expressions in student-friendly language. For example, since the fact that "the student can use photographic equipment correctly and effectively" could not be judged from the portfolios, this criterion was cancelled (Appendix A, Unit 3).

- A scoring sheet combining the assessment criteria and scoring rubric was devised, aiming for an effective evaluation and scoring process (see Appendix C). Furthermore, the student work was awarded grades instead of numerical marks in an attempt to overcome problems such as an accurate interpretation on minute differentiation between marks, for instance, 85% and 87% (Black, 1998: p.74).

  Students need a clear understanding of the performance criteria. We must translate them into words and examples for our students to see (Stiggins, 2001: p.197). For this reason, the scoring sheet was forwarded to the students at the beginning of the target semester, ensuring a better understanding of the scoring and evaluation process, that is, the assessment process was transparent to the students.

- Through a detailed discussion between the teacher and the second assessor, 5 abridged sample portfolios (see next two pages) representing the range of achievement relative to each level of performance for the rating scales in the rubric were selected (see all sample portfolios in Appendix D). It was expected that these samples would help the assessors minimize discrepancies in their assessment process.

Owing to his status as a novice researcher, the teacher had made a number of mistakes in the pilot study. Through careful reflections on the data obtained, he made several revisions to each of the above-mentioned aspects which formed a revised plan for the next cycle of this action research: the main study. The pilot study was used to examine several key aspects in the research design on a smaller scale, leading to a further exploration of the research questions through the next cycle of data collection and analysis, discussed in the following sections.

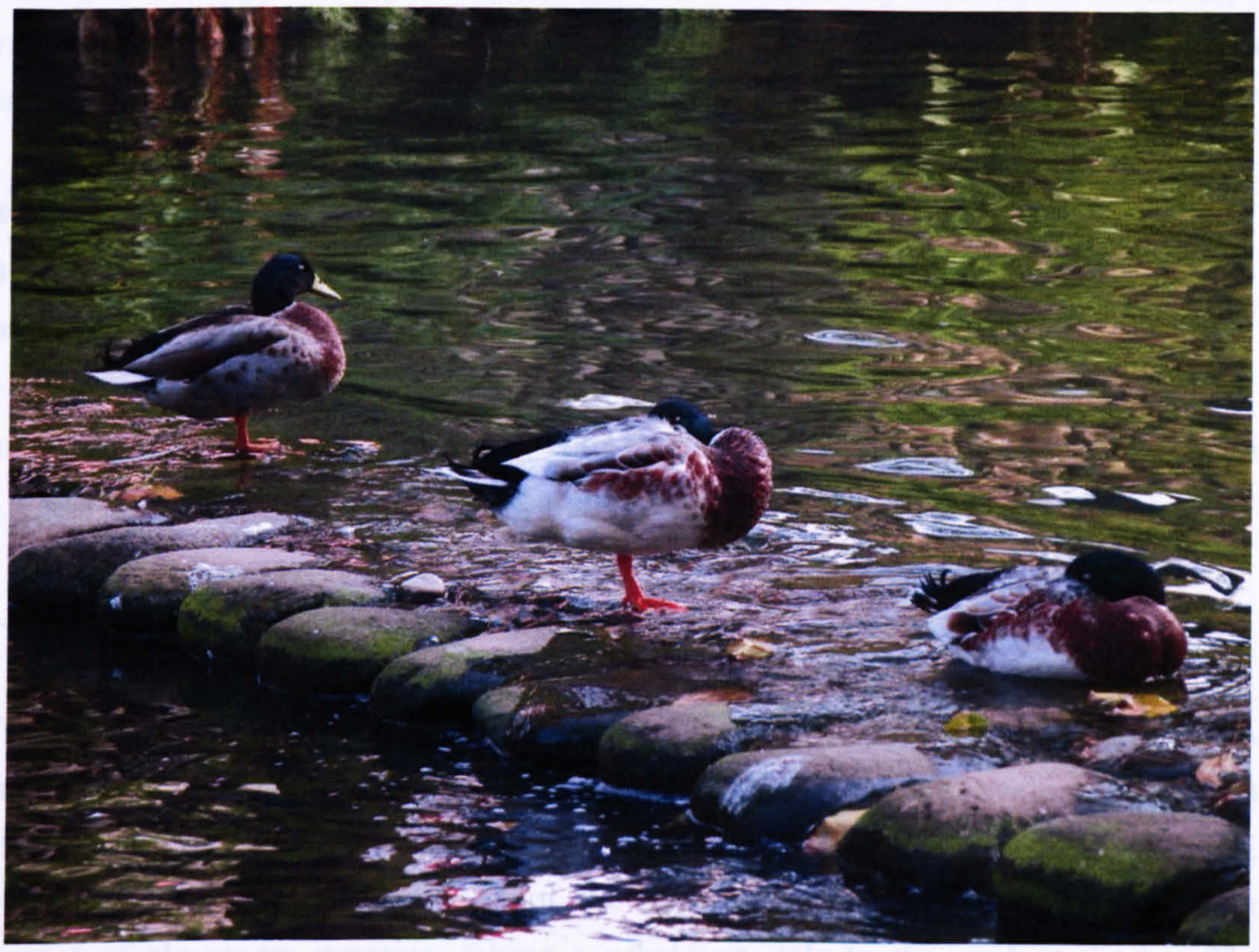
Figure 4.6 A sample page of a portfolio representing the lowest level of performance, that is, a score of 0.



- The picture is not in focus because there was something wrong with my right hand [arm].
- The tree in the middle is brighter than the others, and it is the only tree surrounded by stones.

[…]: annotation(s) by the teacher.

Figure 4.7 A sample page of a portfolio representing the second highest level of performance, that is, a score of 3.



These 3 ducks can be easily grouped together because they are the same species and have similar colors [Gestalt grouping]. Although they are ducks of the same kind and [their bodies] are facing the same direction, there are subtle differences, namely the fact that each duck adopts a different body posture, which can be noticed after taking a close look.

1/60s, f4.1, ISO100, A City Moat

[…]: annotation(s) by the teacher.

4.4 Data collection

Considering the practical difficulties of time, techniques and assessment instruments discussed in the pilot study, the fieldwork in the main study focused on collecting two main types of data: the portfolio data and the diary data. In this section, the author will present:

- the types of data the researcher collected in the main study;
- the linkages between the different types of data and research questions;
- the procedures for collecting data.

In section 4.5, the methods and procedures for data analysis will be described. Section 4.4 and 4.5 aim at exploring the research questions a step further.

4.4.1 Two main types of data

The research project and its data collection adopted an approach taking into account multiple perspectives, namely the portfolio data for course evaluation from the perspectives of the teacher and the second assessor, and the diary data of learning experience from the perspectives of the students. In addition, the teacher kept a journal of classroom practice, taking a subsidiary role to the student diaries. These types of data can be further described as follows:

- **Portfolio**

The student was required to submit four portfolios in a semester: the first three were his or her coursework, and the fourth portfolio was the semester's final result[8]. All portfolios were in electronic format, including 20 photographs and each photograph was accompanied by a self-evaluative essay. In the essay, the student analyzed his or her photographs using Gestalt theory (see table 4.18). A detailed description of the structure and content of the portfolio is provided in Appendix A.

[8] As mentioned in section 4.3, only the *first portfolio* and the *final portfolio* were collected for the research purpose.

Structure of the Portfolio	Photograph	At least 20 photographs should be included in a portfolio. In addition, technical information such as aperture, shutter speed, ISO and date has to be provided for each photograph in the portfolio.
	Self-evaluative essay	Each photograph should be supported by a self-evaluative essay, consisting of at least 100 words. In the essay, the student analyzes and critiques his or her photographs using Gestalt theory.

Table 4.18 The required format of a student portfolio.

As mentioned in section 4.2.3, a primary aim of the research was to have a clear understanding of the extent to which the Gestalt experiences had had a positive impact on student learning outcomes, namely their portfolios. Assessment of the outcomes that attained a high degree of reliability would no doubt play a key role in addressing the research questions. Therefore, in the final week of the target semester, the researcher and the second assessor conducted a joint evaluation of the first and the final portfolios and a follow-up meeting to examine the reliability and effectiveness of the assessment process. Results of these activities served as useful data which would help the researcher verify and validate his research findings.

- **Learning diary**

The teacher invited student volunteers to participate in the diary study to gain insights into their photography learning experiences. In the diaries, the learners made comments about their experiences in or after class on a regular basis. Since keeping a diary was time-consuming, there were no rules about what a student should write or how much he or she should write. That depended on their interests or problems and how much time they had. However, given his own research questions, the teacher-researcher did provide a few guidelines such as 'What have I learned in this week?', 'Are the visual teaching materials easy to understand?', or 'Are there enough photography sessions for me?' and so on. These were provided at the bottom of the diary page as hints as to how they might proceed (see Appendix A, table A4).

During the target semester, the teacher kept a journal of the classroom practice on a weekly basis, reflecting on the teaching methods and curriculum content. It aimed to refine the quality of teaching and learning. In addition, the teacher also kept records of

his observation of classroom activities and student progress in the journal. Reflections and records gathered at this stage were in the form of information, evidence or facts which could be counted as raw data (Richards, Platt and Platt 1992: 96). All the data served as useful, subsidiary information which helped make the meaning of the students' diary entries clearer.

The primary purposes of collecting data from different perspectives were to improve classroom practice and to validate research findings. On the one hand, improving practice involved joint consideration of the quality of both learning outcomes and processes. Although assessments of the quality of learning outcomes, i.e. evaluations of the portfolios in this research context, could help the teacher reflect on the quality of his teaching, they were insufficient as a basis for appraising it. The process of learning and teaching also needed to be taken into account, for which the diary and journal data were collected to serve a complementary purpose. Both product and process, as Elliot argued, needed to be jointly considered in order to improve practice (1991: p.49-50).

On the other hand, the collection of different forms of data also served a triangulation purpose, that is, to validate research findings through different data collection methods. Four types of triangulation could contribute to the verification and validation of a qualitative inquiry: the use of different methods, sources, researchers and theories (Patton, 2002: p.556; Lincoln & Guba, 1985: p.305-307). Referring to this project, the researcher intended to check out the consistency of findings generated from the portfolios and the diaries. However, he did not expect triangulation of different methods would lead to a single, totally consistent picture. The researcher perceived that either consistency in overall patterns of data from different methods or reasonable explanations for discrepancies in data from different approaches could contribute substantially to the overall credibility of findings (Patton, 2002: p.560).

Furthermore, different types of data and its analysis were used to provide answers to different research questions, and the linkages between the data and research questions will be discussed in the following section.

4.4.2 Linkage between data and research questions

In this section, the author intends to demonstrate the links between the research questions and different types of data. Each research question and its focuses are addressed by either the portfolio, the diary, or a combination of the two.

- Main question: Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography? In order to answer this general question, both learning outcomes and processes need to be taken into account, that is, using both the diary data and the portfolio data to address this question.

- Subsidiary question 1: Is image analysis[9] effective in developing students' ability to appreciate and produce photographs? As stated in section 4.2.1, the ability to appreciate photographs was defined as the extent to which a student could analyze the pictures in his or her portfolios using Gestalt theory. Therefore, this research question will be addressed in Chapter 5 by the assessment of student portfolios in relation to both productive and analytical aspects.

- Subsidiary question 2: What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory? This question will be addressed in Chapter 6 by a detailed analysis of the learning diaries, dealing with the issues which express students' personal interests, opinions and experiences in their learning.

- Subsidiary question 3: Have students' learning experience of Gestalt theory influenced their image composing processes? This question is to examine whether students have thought over and utilized Gestalt concepts when composing photographs. This question is addressed in Chapter 6 by a careful analysis of the learning diaries.

The main and subsidiary research questions, together with the relevant data and methods used to address them, are shown in table 4.19.

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9 Hereafter, image analysis refers to image analysis based on Gestalt theory.

Research Question	Data Type	Data Analysis Method
Main question: Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography?	Student Portfolio Learning Diary	Statistical analysis Thematic analysis
Subsidiary question 1: Is image analysis effective in developing students' ability to appreciate and produce photographs?	Student Portfolio	Statistical analysis
Subsidiary question 2: What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory?	Learning Diary	Thematic analysis
Subsidiary question 3: Have students' learning experience of Gestalt theory influenced their image composing processes?	Learning Diary	Thematic analysis

Table 4.19

4.4.3 Procedures for Data Collection

Data collection in the main study was carried out during the second semester of the academic year 2005-6, comprising 18 weeks of classes. The empirical procedures for collecting data are presented in the order in which they occurred during the semester.

In the first week, the teacher invited class members to take part in a diary study, 26 students volunteered to participate, who were then considered to be the student participants. The scoring sheet was forwarded to every student in the class. The teacher started to keep a teaching journal from this week.

In the third week, the students submitted their first portfolios, which were scored and then returned to them with brief comments within a short period of time.

In the fifth week, the students submitted their diaries electronically for inspection, and the teacher gave each student some feedback on the task on the same day.

In the tenth week, the students submitted their diaries for inspection and feedback for the second time. However, only 23 of the 26 students handed in their diaries. Since the number of student participants was reducing, the teacher sent an email to encourage them to continue. He also made every effort to provide them with immediate and detailed feedback.

In the fifteenth week, once again the students were requested to submit their diaries for inspection, and 23 students handed in their work.

In the eighteenth week the students submitted their final portfolios and learning diaries. Only 21 students handed in their diaries. One week later on Monday night, the teacher and the second assessor jointly evaluated the first and the final portfolios, and afterwards they discussed the results from the cooperative assessment in a follow-up meeting. The results of the joint evaluation and meeting will be further discussed in Chapter 5.

In relation to the collected data, the researcher obtained the learning diaries and portfolios from the student participants; the results of the joint evaluation (of the portfolios) and its follow-up meeting from the teacher and the second assessor, and the teaching journal (subsidiary to the diaries) from the teacher. As to methods of analyzing and interpreting the obtained data, they are discussed in the following section.

4.5 Data Analysis

As described in section 4.4, there were two main types of data in the main study, namely the portfolio data and the diary data. In this section, the author will describe the methods and procedures for analyzing and interpreting each type of data as follows:

- The methods and procedures for the analysis and interpretation of the portfolio data, followed by a discussion of reliability and validity issues concerning the assessment of the student portfolios.

- The methods and procedures for the analysis and interpretation of the diary data, accompanied by a discussion of dependability and credibility issues.

4.5.1 Analysis and Interpretation of the Portfolios

As mentioned in 4.2.3, the researcher needed to measure student progress in both the productive and analytical (appreciative) aspects over a semester in order to provide evidence to justify the argument that image analysis based on Gestalt theory can be helpful in improving students' understanding and practice in photography. Through comparisons between the first and the final portfolios, the researcher could determine the extent to which the Gestalt training had influenced student performance. Differing from the pilot study, the progress of the 21 student participants in the main study was assessed as a whole using a statistical method, that is, an *Effect Size* measure.

Effect Size is basically a way of quantifying the effectiveness of a particular intervention. It allows us to go beyond the simplistic question, 'Does it work or not?' to the more sophisticated one, 'How well does it work?' Moreover, by placing the emphasis on the most important aspect of an intervention — the size of the effect, it promotes a more accurate approach to the accumulation of knowledge. For these reasons, Effect Size is an important tool in reporting and interpreting effectiveness (Coe, 2000). Usually it is used in research for comparing the results of an experimental group and a control group, while in this study outcomes (portfolios) of the same students were compared and contrasted. In addition, assessment results from the second assessor needed to be taken into account when assessing the effectiveness of the teacher's intervention.

The author will describe the procedures for validating findings from the portfolios in sequence, starting with a reliability test and afterwards an exposition of validity issues.

(1) First, in order to justify whether the assessment results accurately reflected student proficiency, an inter-rater reliability test was carried out. The purpose of the test was to ensure: (a) the consistency between the scorings of the teacher and the second assessor (b) the score spread of the student portfolios. A Spearman rho correlation was performed on the scores of the two assessors, along each assessment dimension, to determine the statistical relationships between their scores. If different assessors, applying the same criteria, discovered the same thing, then faith in the account as a true one was enhanced (Seale, 1999: p.41).

(2) Next, although a lot of effort, such as providing sample portfolios and conducting follow-up meetings, has been made to ensure a high degree of reliability, this alone might not be sufficient for the research purpose. In part, this would be because the assessment might not reflect the teaching aims of the curriculum. This relates to the problem of *content validity*.

Black (1998: p.42-43) argues that if the intention is to test that a given syllabus has been learned, then the researcher might check whether the assessment tasks match the curriculum content and teaching aims, and do not go beyond the boundaries – this would be content validity. He suggests that content validity can be enhanced by both the content covered and the cognitive or skill level of the assessment tasks conforming to a set of syllabus criteria.

Referring to the 'Image Aesthetics' curriculum, each course unit contained the statements of the objectives that each student was expected to achieve against a set of performance criteria which closely matched the content of teaching (see Appendix A). The performance criteria specified in descriptive detail the nature of the expected outcomes. Furthermore, the scoring sheet which integrated the assessment criteria and rubric would certainly help the researcher address the above-mentioned problem, ensuring the assessment of student performance related directly to the assessment criteria for the curriculum content. In other words, teaching and assessment were in alignment with each other (Webb, 1997: p.3-4).

Similar to the pilot study, the portfolio assessment had *ecological validity*, because usual methods and procedures were used in the assessment process; the purpose of assessment was highly relevant to the curriculum content, and it was conducted by the students' usual teacher.

In order to ensure the assessment meshed with the curriculum, the performance criteria were purposefully confined to the content of teaching. In this case, however, there was a danger that the assessor might overlook certain characteristics of student performance or even 'stifle' artistic creativity in the students. On rare occasions, the teacher had difficulty in judging student photographs against these curriculum-oriented criteria. Obviously, the ensuing dialogue between the teacher and the second assessor after the joint evaluation helped to make it clear that student works which did not follow the teacher's instruction still might be expressive or outstanding (Dorn et al, 2004: p.118; see for example, figure 4.8).



Figure 4.8 A student photograph which showed no clear signs of applying Gestalt principles.

In Chapter 5, the progress of the students will be reported along the three assessment dimensions, namely Photographic Technique, Theory Analysis and Theory Application. A comparison between the assessment results of the teacher and the

second assessor is also included, through which a credible account of student progress can be provided if the results are consistent. In other words, the researcher was using multiple analysts to review findings. This approach, analyst triangulation, helped to reduce the potential bias that came from a single person doing all the data processing and analysis and provided a solid base for determining programme effectiveness (Patton, 2002: p.556-560).

4.5.2 Analysis and Interpretation of the Diaries

Coding is by far the most common procedure in qualitative data analysis, representing the researcher's thoughts about how data might be organized, retrieved and interpreted (Seale, 1999: p.154). Miles and Huberman suggest that coding constitutes the "stuff of analysis", allowing one to "differentiate and combine the data you have retrieved and the reflection you make about this information" (1994: p.56).

Thematic analysis, through which the diary data was analyzed, is a process for coding qualitative information. It is not another qualitative method but a process that can be used with most qualitative inquiries. The coding process requires an explicit 'code' or 'coding system'. This may be a list of themes; a complicated model with themes, indicators, and qualifications that are closely related. The interpretation phase of research follows development and use of such a thematic code (Boyatzis. 1998: p.4-5).

In this section, the author will describe the procedures in developing a coding system using thematic analysis, referring to the stages and steps proposed by Boyatzis with a number of modifications (ibid, p.41-51). The use of thematic analysis involves three distinct stages:

- Stage I: deciding on sampling and design issues.
- Stage II: developing themes and a coding system. There are three main different approaches to develop a coding system, namely theory driven, prior data or prior research driven, and data driven. Since the diary analysis was working on the raw data — the learning diaries, a data driven approach was adopted.
- Stage III: using the coding system, interpreting results and determining credibility.

Details of the stages and steps are shown in table 4.20.



Stage		Data Driven Approach
I	1.	Deciding on sampling and design issues
	2.	Selecting subsamples
II	1.	Identifying patterns within subsamples
	2.	Comparing themes across subsamples
	3.	Creating a coding system
	4.	Determining the dependability of the coding system
III	1.	Applying the coding system to the remaining data
	2.	Interpreting results
	3.	Determining credibility

Table 4.20 Summary of Stages and Steps in Using Thematic Analysis. Modified from table 2.1 (Boyatzis, 1998: p.44).

4.5.2.1 Stage 1: Sampling and Design Issues

- Step 1: Deciding on sampling and design issues

The researcher separated the 21 participants into performance groups according to the total scores of the three assessment dimensions[10] of their final portfolios. The score spread is shown in table 4.21. A total score of 0 to 6 is classified as low-performing, 7 averaging-performing, 8 to 12 high-performing. The reason for differentiating these groups was to make certain that the researcher could have the same number of students in the low- and high-performing groups. Accordingly, 9 students were allocated to the low-performing group, 3 to the average-performing group, and 9 to the high-performing group.

Total Score	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
No. of students	0	0	0	2	1	2	4	3	2	4	0	2	1

Performance Group	**0 - 6:** Low-performing	**7:** Average-performing	**8 - 12:** High-performing
No. of students	9	3	9

Table 4.21

[10] They are the dimensions of Photographic Technique, Theory Analysis and Theory Application.

In this step, only the low- and high-performing groups were adopted as the basis for selecting subsamples. Since the two groups were polar opposites, the main purpose of using them for sampling was to ensure that a wider range of themes could be identified in the following steps.

- Step 2: Selecting subsamples

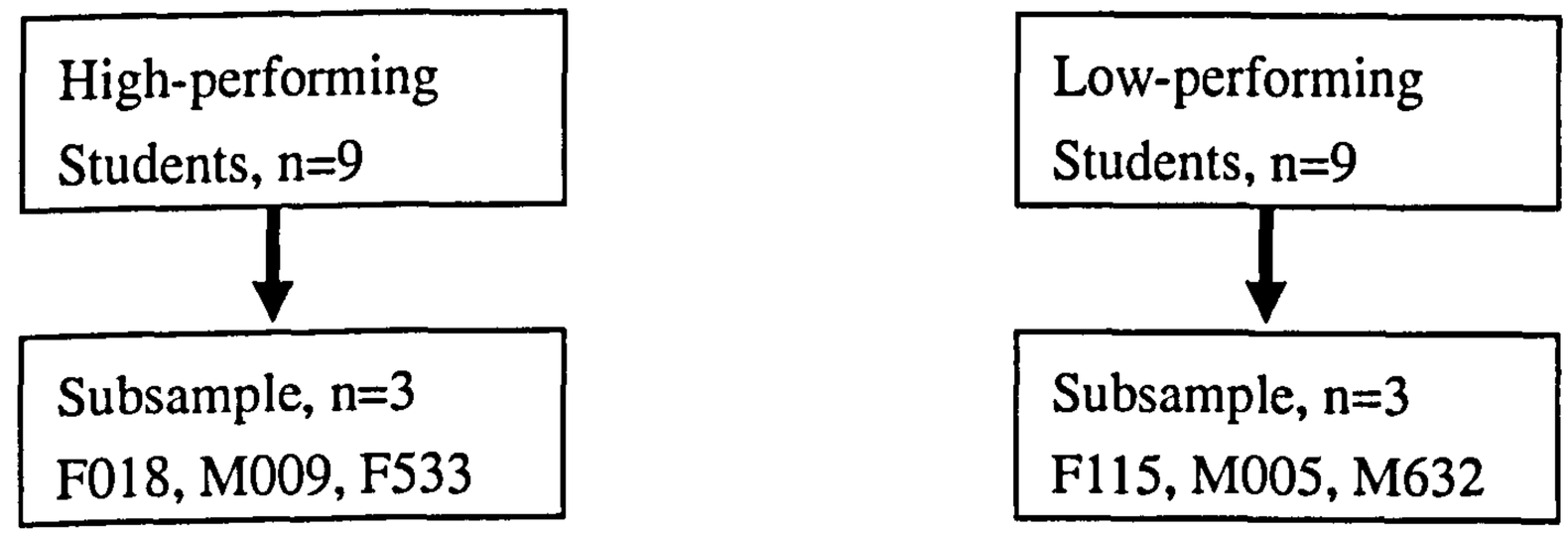


Figure 4.9 Stage 1, Step 2: Selecting subsamples

To develop a coding system, the researcher randomly selected a subsample, i.e. 3 students, from the high- and low-performing groups. The raw information collected from these two subsamples, namely 6 learning diaries, was to be the basis for developing the coding system.

4.5.2.2 Stage 2: Developing Themes and a Coding System

- Step 1: Identifying patterns within subsamples

The researcher compared and contrasted the diaries from one subsample, looking for similarities, repetitive patterns within the high-performing subsample; and repeated the same process for the low-performing subsample (see figure 4.10).

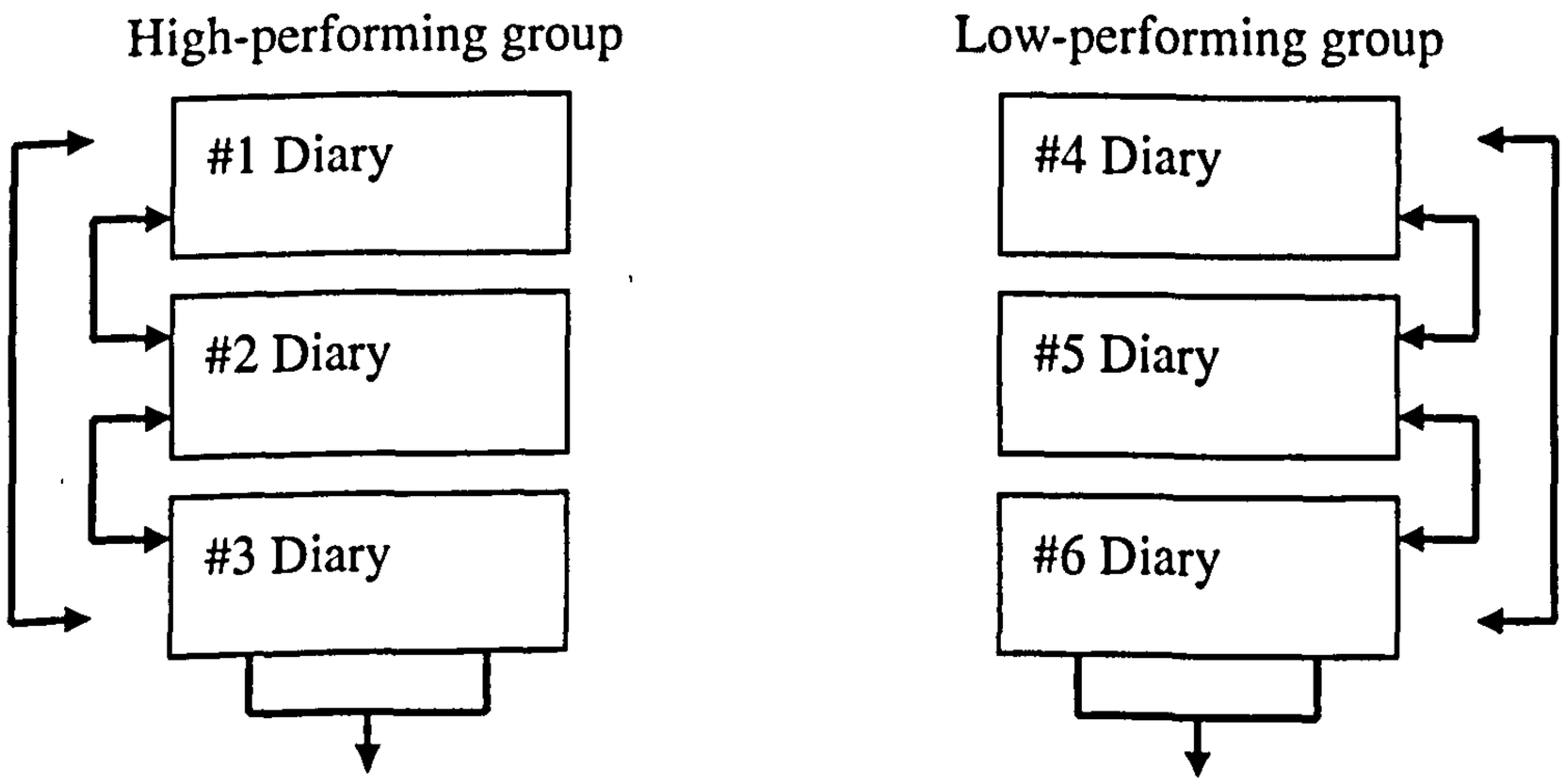


Figure 4.10 Stage 2, Step 1: Identifying patterns within subsamples

- Step 2: Comparing themes across subsamples

The patterns, or themes, identified as similar within each group were compared and then combined to form a set of preliminary themes, as shown in figure 4.11.

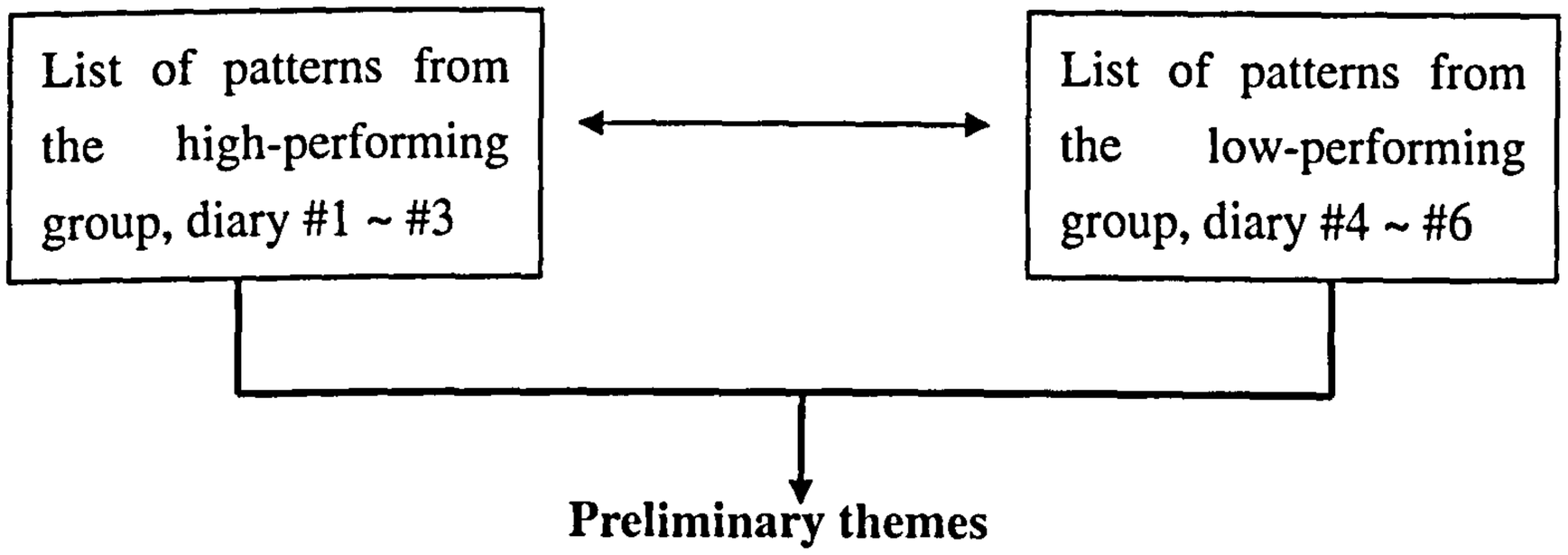


Figure 4.11 Stage 2, Step 2: Comparing themes across subsamples

- Step 3: Creating a coding system

To begin Step 3, the set of themes identified in the last step was reviewed. The researcher returned to the raw information and carefully reread the diaries while attempting to determine the presence or absence of each of the preliminary themes. To perform this task, he rewrote or reconstructed each statement of the preliminary themes into a revised set of themes, i.e. the coding system (see figure 4.12). As the coding process evolved, a total of six different versions of the coding system emerged. The one shown in figure 4.12 was the fifth version. Readers are referred to Appendix E for the evolving process of developing the coding system.

- Step 4: Determining the dependability (reliability) of the coding system

To ensure that his coding of student diaries was reliable, the researcher applied the coding system to another subsample, F214 and M616, from the remaining diaries. They accounted for approximately 10% of the total participants, namely 2 out of 21. One month afterwards the researcher recoded the same material applying the same coding system, as shown in figure 4.13. This allowed the determination of intra-rater reliability, or dependability. The term 'dependability', as Lincoln and Guba argued, was the qualitative equivalent for the conventional term 'reliability' (1999: p.407). Although they were interchangeable, the former might be more appropriate for this diary study. Using the following percentage agreement equation (modified from Boyatzis, 1998: p.155) for each theme in the coding system, the researcher was able to determine the degree of consistency of the two codings.

$$\text{Percentage agreement} = \frac{2 \times (\text{no. of times both the } 1^{st} \text{ and } 2^{nd} \text{ coding saw it present})}{\text{no. of times the } 1^{st} \text{ coding saw it present} + \text{no. of times the } 2^{nd} \text{ coding saw it present}}$$

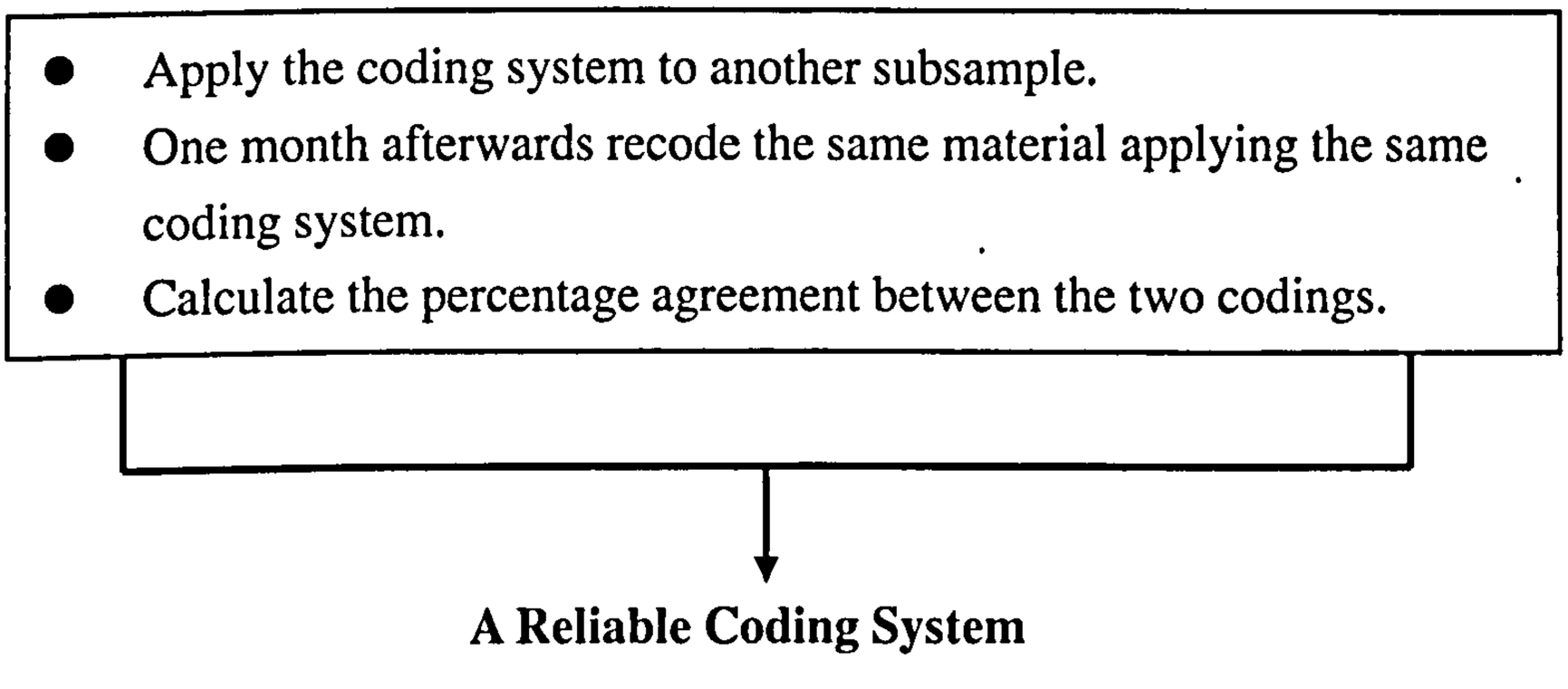
The themes for which a high level of consistency was achieved could be considered a reliable coding system, or reliable set of themes (ibid, p.50). Using percentage agreement scores, the researcher achieved a high degree of intra-rater reliability for all the thematic themes, with a range from 75% to 100%.

Figure 4.12 Stage 2, Step 3: Creating a coding system

- General response to the course
  - Course activities
  - Thoughts on the course
  - Character of the teacher
  - Comments on personal progress
- Photographic technique
  - Technical difficulty
  - Technical development
- Image appreciation
  - Subjective judgment
  - Theory difficulty
  - Theory understanding
- Theory application
  - Acute sense of image
  - Theory reflection
- Artistic perspective
  - Nature of photography
  - Having an intention
  - Art appreciation

A Coding System

Figure 4.13 Stage 2, Step 4: Determining the reliability of the coding system



4.5.2.3 Stage 3: Using and Validating the Coding System

- Step 1: Applying the coding system to the remaining data

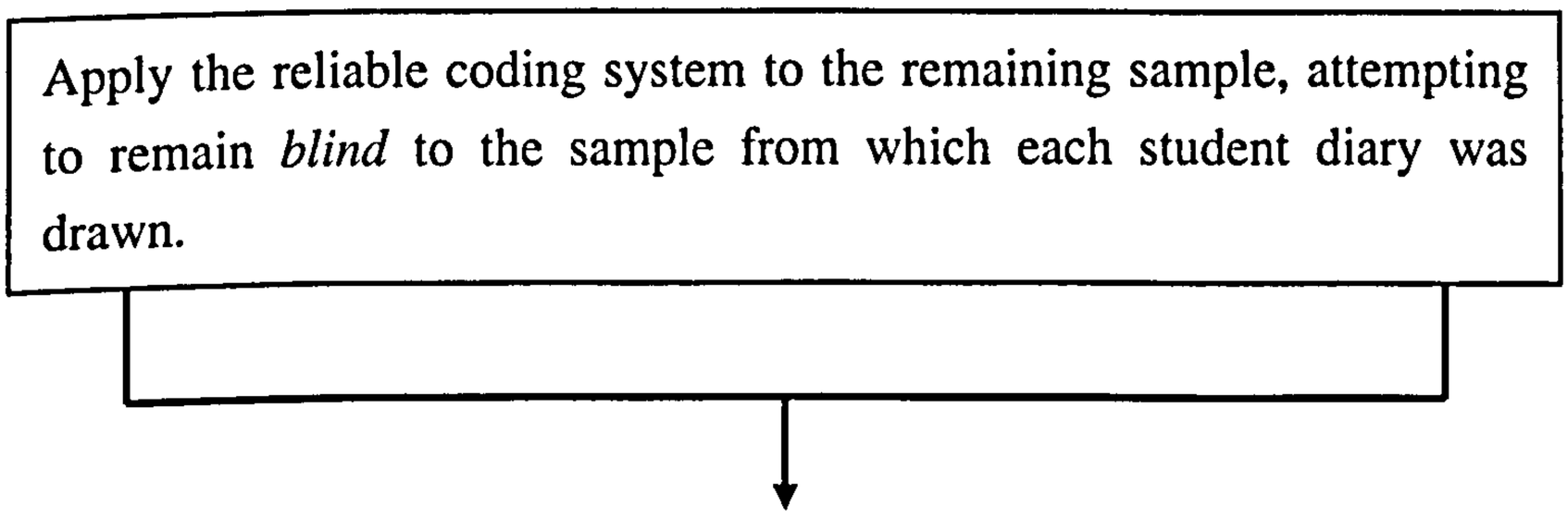


Figure 4.14 Stage 3, Step 1: Applying the coding system to the remaining data

The researcher applied the reliable coding system to the remaining diaries, as shown in figure 4.14[11].

- Step 2: Interpreting results

Classifying and coding qualitative data produce a framework for describing what has been collected during the fieldwork, and this descriptive phase of analysis forms the basis for the following interpretive phase (Patton, 2002: p.465). Interpretation of the findings based on the coding system will be reported in Chapter 6.

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[11] During this period, the coding system had gradually evolved into its final phase, i.e. the sixth version. Readers are referred to Appendix E for further information.

- Step 3: Determining credibility

Lincoln and Guba describe *member checks* as the most "crucial technique for establishing credibility" in a qualitative study (1999: p.418). It comprises taking data and interpretations back to the participants in the study so that they can confirm the credibility of the information and narrative account. Several procedures facilitate this process. An often reported strategy is to convene a focus group or a validation session for participants to review the final analysis report (Lincoln & Guba, 1999: p.418-419; Creswell & Miller, 2000: p.127). Throughout the process, the researcher asks participants:

"...if the themes or categories make sense, whether they are developed with sufficient evidence, and whether the overall account is realistic and accurate." (Creswell & Miller, 2000: p.127).

...

Question 4: Application of theory[12]

An acute sense of observation is a prerequisite for photographers to find appropriate subjects. A few students (2/21) perceived it as a natural talent, which would enable them to seize perfect opportunities for combining photographs with theories. But for many learners (7/21), the integration of Gestalt theory and their work was quite difficult and to a certain extent impractical.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

...

Table 4.22 A sample question in the validation form. Readers are referred to Appendix F for an unabridged form.

In April 2007, the researcher conducted a validation session for his diary analysis, in

12 Each question is linked to a major theme in the coding system.

which the 21 diarists were invited to participate. There were 12 students (12/21) who attended the session. During the process, the researcher first explained to the participants the purpose and the subject matter of the meeting. Afterwards, he gave each student an analysis report to read through and then asked them to fill out a validation form (see table 4.22). In turn, he incorporated the participants' comments into the final report. Therefore, the participants added credibility to the study by having a chance to respond to both the data and the analysis account (ibid). Ensuring the dependability (Stage 2, Step 4) and credibility were means to establish trustworthiness for a qualitative study, through which a true and persuasive account could be provided (Lincoln & Guba, 1999: p.398). The results of the validation session will be reported in Chapter 6.

4.5.2.4 Using CAQDAS to analyze the dairy data

The researcher used CAQDAS (computer-assisted qualitative data analysis software), NVivo, to assist the diary analysis and the development of the coding system. In comparison with manual methods, the main benefits were seen to be the speed that CAQDAS offered the analyst for handling large amounts of data; the improvements in rigour or consistency of approach; the ability of computer software to assist with conceptualisation of data; and the relative ease of navigation and linking of data (Ritchie & Lewis, 2003: p.207).

Weitzman provides the most up-to-date categorisation of CAQDAS software, which categorises software into five types (ibid, p.206-207):

- *Text retrievers* which facilitate the searching of large amounts of data for instances of words or phrases;
- *Textbase managers* which provide a structure to the data stored and are usually searchable in a similar way to text retrieval programs;
- *Code and retrieve programs* that allow us to label passages of text that can later be retrieved according to the codes applied;
- *Code based theory builders* which support the conceptualization of data by the analyst and also have extended hyperlinking facilities which allow the analyst to create links between different aspects of the data set;
- *Conceptual network builders* which facilitate the graphic display and investigation of conceptual, cognitive or semantic networks within a data set.

NVivo is the software that cuts across this classification and fulfils all of the functions described above. In addition, it is licensed software which can be accessed on the computers at Durham University. These were the criteria for choosing NVivo to assist the researcher in the development of the coding system and the management of the diary data.

4.6 Limitations of the Study

Although the researcher had made considerable effort to ensure trustworthiness of this inquiry, there were certain limitations and disadvantages of the research design, data collection and data analysis. They are:

- Limitations of Kemmis's model of the action research process

The researcher adopted Kemmis's model of action research which involves a self-reflective spiral of planning, action, observation and reflection (see figure 4.1). Usually in action research other ideas and problems arise which are not the main focus of the study but are relevant and need to be addressed to facilitate progress of the main focus. McNiff argues that Kemmis's model is unable to deal with this spontaneity and untidiness. The model is presented as if life goes in a linear sequence, along a one-way path only. It does not recognize the existence of related issues, nor provide options for dealing with them (McNiff & Whitehead, 2002: p.48).

- Threats to the validity of the portfolio assessment

One typical design for this research on student learning outcome is the quasi-longitudinal study[13], namely the student participants were essentially their own comparison group (in a narrow sense, 'control group') and the difference in outcomes was assessed on the performance of the first portfolio and the final portfolio over the course of a semester. There are threats, as Lincoln and Guba argue (1999: p.398-399), to the validity of this kind of assessment. A typical threat is the history effect, that is, the specific external events occurring between the first and second assessment other than the planned intervention (ibid). Referring back to the portfolio assessment, during the target semester, the students might have attended an extracurricular photography course or joined a photography club, which certainly would have had an impact on the validity of the researcher's judgment on student progress. However, as

[13] Since the participants were not interviewed or given the same test twice during the target semester, i.e. the definition of a prospective longitudinal study (Ruspini, 2002: p.3-4), thus the term 'quasi-longitudinal study' was used.

the main purpose of the intervention was to promote growth, assessing student performance repeatedly over a period of time with the same subjects provided the most reliable data on their progress (Ruspini, 2002: p.4).

- Disadvantages of the diary as a method of data collection

1. Problems with generalizability – the usual concerns regarding subjects in diary studies hinge around the small number of learners involved. As with other diary studies, the figure ranged from only one subject to the largest number of 51 learners (Bailey, 1991: p.78). But even 51 is a very small number by statistical standards. In this diary study, there were only 21 students involved. Given the small number of subjects, and the fact that all the subjects were volunteers (not necessarily a representative sample), the generalizability of the findings of this study is limited.

2. Problems in data collection – a critical question about the status of the diary data, and the interpretations derived from them is (Nunan, 1992: p.123):

"To what extent do the diary entries realistically reflect what was really going on at the time the recordings were made?"

The researcher does not know how many of the diarists' learning processes operated within their conscious awareness and were therefore available as objects of introspection. Bailey argues that in diary studies, those learning processes which learners choose to write about are potentially a smaller group than are all the conscious processes which learners might write about, and this subset of conscious processes is likely smaller than the entire range of learning processes, both conscious and unconscious (1991: p.80). She further acknowledges that diaries, as data collection devices, can only access some subset of learning processes. Although Bailey is referring to language issues, this limit is likely to be applied to photography learning processes. Nevertheless the problem, diary researchers such as Nunan (1992: p.123) and Bailey (1991: p.87) argue that diary and journal entries provide insights into process of learning which would be difficult, if not impossible, to obtain in any other means.

- Problems in the validation of the diary analysis

As mentioned in section 4.5.2.3, the teacher-researcher invited his own students to review the final analysis report in the validation session. Through a closer examination of their responses, it seems that some of diarists, 2 out of the 12 participants, were unwilling to make negative comments about the report, because perhaps they were on familiar terms with the teacher. For example, F533 responded positively to all the questions, i.e. choosing the 'Agree' option (see Appendix F), in the validation form without providing a single word for her evaluation. This echoes one of Emerson and Pollner's findings that people with whom the researchers were friendly appeared to be less willing to criticize their report (1988: p.192). As a result of this kind of reassuring responses, the researcher might not be able to justify whether the member validation was itself valid.

4.7 A brief summary

In summary, this chapter has presented firstly the theoretical framework and contexts of the research, followed by a detailed account of the pilot study and its implications for the main study. There follows a more empirical account of this project. The next two sections deal respectively with the procedures for data collection and analysis. This chapter finishes with a discussion of the limitations of the research design and methodology, which carries practical implications for future studies.

Chapter 5 Findings and Interpretations: the Teacher's Perspective

As mentioned in Chapter 4, the researcher measured student progress in both the productive and appreciative aspects over a semester to justify the argument that image analysis based on Gestalt theory could be a valuable approach to teaching photography. The purpose of the present chapter is thus to assess progress in the portfolios of the target students to answer the main research question and the first subsidiary research question: "Is image analysis effective in developing students' ability to appreciate and produce photographs?" As summative assessment, this process needed to be both reliable and valid (Baume & Yorke, 2002: p.12).

Given that the assessment process was designed to assess explicitly whether the participants had achieved the stated learning outcomes of the course, the claims to validity were thought to be reasonably high. However, the overall validity of the assessment approach would have been weakened if there were divergences between the assessors, i.e. indications of unreliability (ibid). Thus a reliable assessment of the students' work would be a prerequisite for course evaluation from the teacher-researcher's perspective. Taking this into consideration, this chapter starts with a discussion of the inter-rater reliability issues, continues with a detailed account of student progress along the three assessment dimensions, namely Photographic Technique, Theory Analysis and Theory Application, and ends with an analysis of the issues that arose from the assessment results.

5.1 Assessor Agreement

In June 2006, the teacher and the second assessor conducted a joint evaluation of the first and the final portfolios of the target students to examine the reliability and effectiveness of the assessment process. The results of the first portfolios are shown in tables 5.1 and 5.2.

A Spearman rho correlation was performed on the scores of the two assessors, along each dimension to determine the relationships between their scorings. The statistical results showed a significant level of agreement ($t_{.975(19)} = 2.093$, $p < 0.05$) between the assessors in relation to the Photographic Technique and Theory Application dimension, but there was *no significant correlation* between the judges for the Theory Analysis dimension.

Score	Student	M316	M005	F018	F042	F371	M632	M509	F533	M641	F115	F214	F233	F937	M610	M332	M616	M573	M048	M520	M402	M009
Lu	Photographic Technique	1	1	1	0	1	1	1	2	0	0	0	3	1	3	1	1	2	0	1	2	1
	Theory Analysis	0	0	1	1	1	1	0	2	0	1	1	2	1	2	1	2	0	0	0	2	1
	Theory Application	0	0	0	0	0	1	0	2	0	0	0	2	0	2	0	1	1	0	0	2	1
Huang	Photographic Technique	1	0	2	1	0	1	2	3	2	1	1	3	0	3	1	1	2	1	0	2	1
	Theory Analysis	1	1	1	0	0	1	1	2	1	2	1	2	1	2	2	1	2	0	0	1	1
	Theory Application	1	0	1	1	0	0	2	3	2	1	0	3	0	3	1	0	1	0	1	1	2

Table 5.1 The assessment results of the first portfolios.

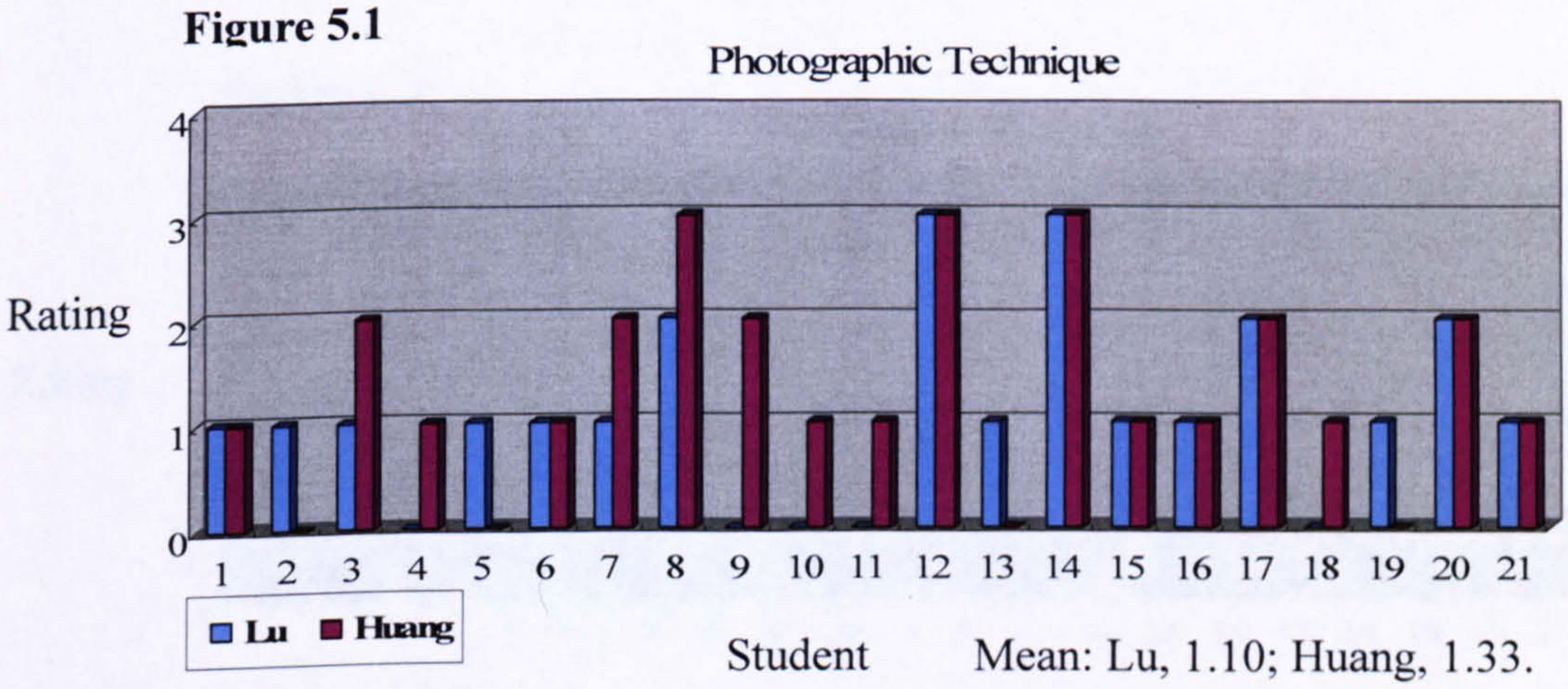
Assessor / Score	Lu		Huang	
	frequency	percentage	frequency	percentage
0	25	39.7%	15	23.8%
1	24	38.1%	28	44.4%
2	12	19.0%	14	22.2%
3	2	3.2%	6	9.5%
4	0	0.0%	0	0.0%

Table 5.2 A score spread of the assessors.

- Photographic Technique: Spearman rho = 0.490, $t = 2.448$, significant correlation.
- Theory Analysis: Spearman rho = 0.379, $t = 1.783$, no significant correlation.
- Theory Application: Spearman rho = 0.440, $t = 2.145$, significant correlation.

In view of the assessors' scores along each dimension (see figure 5.1), it seems that the major problem in the pilot study, i.e. the scores had similar patterns but at different levels, has been partially addressed. In general, Huang's scores of the first portfolios are somewhat higher.

Figure 5.1

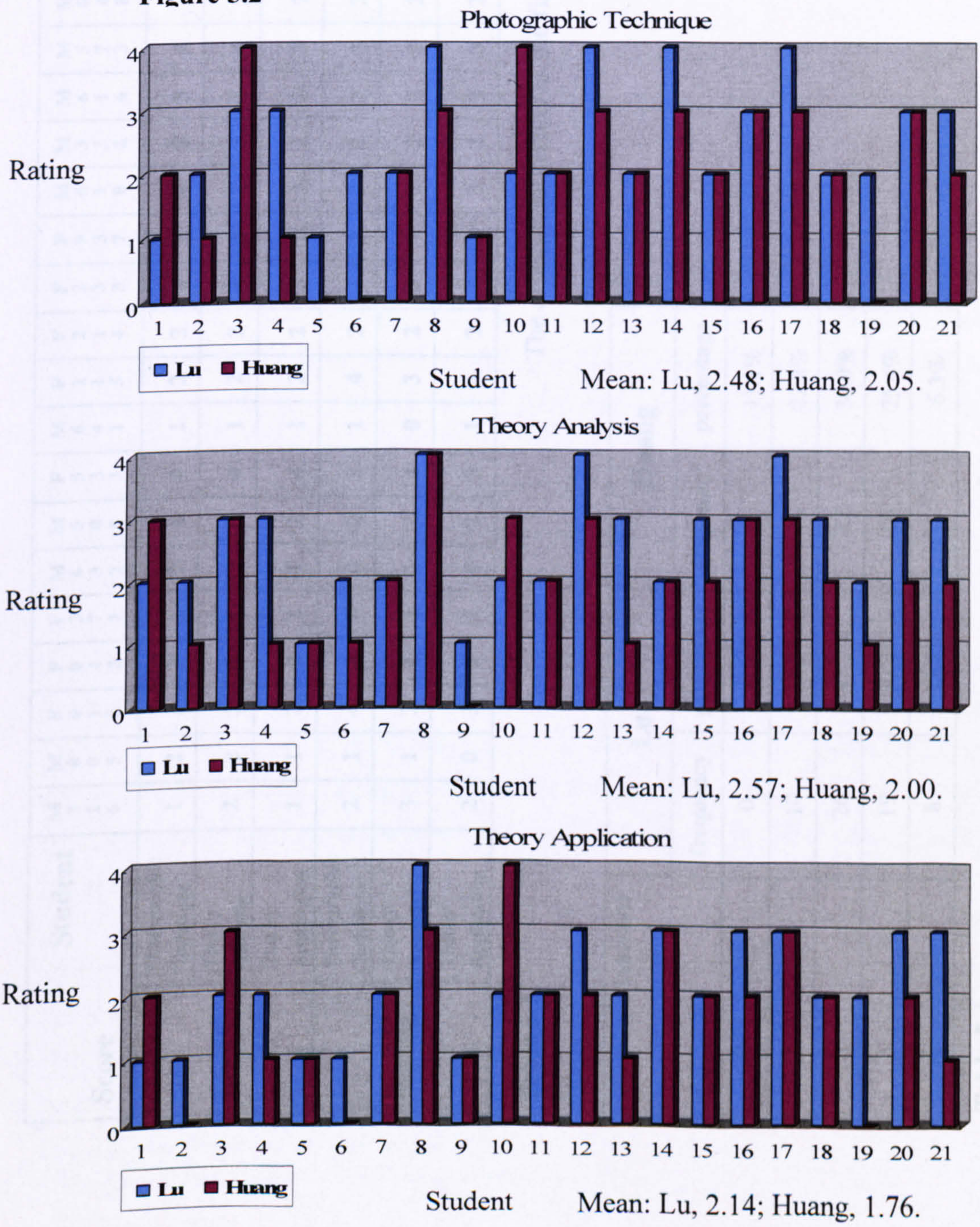


The results of the final portfolios are shown in tables 5.3 and 5.4 (see next page). The statistical results of the scores showed a significant level of agreement ($t_{.975(19)} = 2.093, p < 0.05$) between the assessors along all 3 dimensions.

- Photographic Technique: Spearman rho = 0.628, $t = 3.516$, significant correlation.
- Theory Analysis: Spearman rho = 0.565, $t = 2.988$, significant correlation.
- Theory Application: Spearman rho = 0.541, $t = 2.803$, significant correlation.

Overall, Huang's scores of the final portfolios are somewhat lower (see figure 5.2).

Figure 5.2



Score \ Student		M316	M005	F018	F042	F371	M632	M509	F533	M641	F115	F214	F233	F937	M610	M332	M616	M573	M048	M520	M402	M009
Lu	Photographic Technique	1	2	3	3	1	2	2	4	1	2	2	4	2	4	2	3	4	2	2	3	3
	Theory Analysis	2	2	3	3	1	2	2	4	1	2	2	4	3	2	3	3	4	3	2	3	3
	Theory Application	1	1	2	2	1	1	2	4	1	2	2	3	2	3	2	3	3	2	2	3	3
Huang	Photographic Technique	2	1	4	1	0	0	2	3	1	4	2	3	2	3	2	3	3	2	0	3	2
	Theory Analysis	3	1	3	1	1	1	2	4	0	3	2	3	1	2	2	3	3	2	1	2	2
	Theory Application	2	0	3	1	1	0	2	3	1	4	2	2	1	3	2	2	3	2	0	2	1

Table 5.3 The assessment results of the final portfolios.

Assessor / Score	Lu		Huang	
	frequency	percentage	frequency	percentage
0	0	0.0%	7	11.1%
1	10	15.9%	14	22.2%
2	26	41.3%	22	34.9%
3	19	30.2%	16	25.4%
4	8	12.7%	4	6.3%

Table 5.4 A score spread of the assessors.

The results of the cooperative assessment were in agreement with literature which indicated that teachers scored their own students' work either somewhat higher or lower than independent assessors (Dorn et al, 2004: p.118). A follow-up meeting was held shortly after the joint evaluation to discuss issues arising from the assessment results. They were:

- the scoring sheet (see section 4.3.4.3) helped the individual assessors maintain consistency in the evaluation process, that is, to ensure intra-rater reliability.
- the sample portfolios (ibid) helped the assessors minimize discrepancies in applying the assessment criteria to the same student work.
- the sample size (21) was relatively small so that any inconsistent appraisals of a single student portfolio might lead to a statistical failure. In this case, it might well be the score difference in the Theory Analysis dimension of M573's first portfolio which caused the failure, namely that there was no significant correlation between the judges along this dimension.

Although most of the statistical tests showed that there were significant correlations between the assessors, the inter-rater correlation measure did have an inherent limitation. The measure would have produced a high value even when the assessors' ratings had similar patterns but at different levels (Baume & Yorke, 2002: p.14). In relation to the pilot study and main study, this phenomenon was not at all uncommon ().

In view of this limitation, Baume and Yorke suggested that the inter-rater reliability could be calculated at three levels of percentage agreement: exact agreement (assessors awarding the same score), close agreement (assessors awarding either the same score or adjacent scores) and pass/fail agreement[1]. The researcher chose to focus on the *close agreement* in respect of the portfolio assessment, since to do so allowed him to compare his results with those from the literature on similar studies (e.g. Nystrand, Cohen & Dowling, 1993; Baume & Yorke, 2002). Table 5.5 shows the percentages of close agreement between the two assessors for the first portfolios and the final portfolios. The percentages of exact agreement are also included for the purpose of comparison with other studies.

Comparing the data in table 5.5 from the current study with those from the work presented in table 5.6, the percentages of close agreement between the assessors, i.e. 93.7% and 85.7%, are much higher than that from Nystrand *et al.*, 19 – 71%, and stand comparison with the evidence from Baume *et al.*, 88%.

[1] The pass/fail agreement was irrelevant to this study.

Table 5.5 Percentages of close and exact agreement between the assessors of the 21 portfolios.

Evaluation / Agreement	First Portfolio		Final Portfolio	
	frequency	percentage	frequency	percentage
Close Agreement	59	93.7%	54	85.7%
Exact Agreement	23	36.5%	23	36.5%

Table 5.6 Inter-rater agreement from two studies of portfolio assessment.

Researchers / Agreement	**Baume *et al.*** (*ns* vary from 7 to 109)	**Nystrand *et al.*** (*n* = 53)
Close Agreement	88% (Course outcomes)	19 – 71%
Exact Agreement	39% (Course outcomes)	Not reported

(Nystrand *et al.*, 1993: p.61; Baume et al, 2002: p.15)

To summarize, after evaluating performance, when the two assessors generally agreed on the level of proficiency demonstrated, then the researcher had evidence that the results reflected student proficiency and therefore progress (Stiggins, 2001: p.218). The progress of the target students as a whole is described in the following section.

5.2 Student Progress

In order to access student progress, raw differences between the first portfolios and final portfolios were standardized by dividing by the pooled standard deviation of the two sets of scores (see equation 1). This measure, called either 'Standardized Effect Size' or simply 'Effect Size', provides a way for comparing the results from similar studies and evaluating the practical importance of a finding (William, Lee, Harrison & Black, 2004: p.57). Table 5.7 displays the means, standard deviations (SD), pooled standard deviations (SD_{pooled}), and effect sizes for each assessment dimension of the student work.

$$\textbf{Effect Size} = \frac{\textbf{[Mean of the final portfolios]} - \textbf{[Mean of the first portfolios]}}{\textbf{Pooled Standard Deviation}}$$

Equation 1

Assessor		First Portfolio		Final Portfolio		SD_{pooled}	Effect Size
		Mean	SD	Mean	SD		
Lu	Photographic Technique	1.10	0.89	2.48	0.98	0.94	1.48
	Theory Analysis	0.90	0.77	2.57	0.87	0.82	2.03
	Theory Application	0.57	0.81	2.14	0.85	0.83	1.89

Table 5.7

As can be seen, the effect sizes of the Photographic Technique, Theory Analysis and Theory Application dimensions are 1.48, 2.03 and 1.89 respectively, and these give a mean of 1.80. When compared with other studies of educational innovation, these figures show exceptionally positive learning outcomes, and the mean is possibly one of the largest average effects ever reported for a teaching strategy. For example, in a meta-analysis of 25 studies involving measures of student achievement, the reported effect sizes range in magnitude from 0.02 to 1.9 plus (Guskey & Gates, 1986: p.75). Furthermore, several syntheses of educational research (see table 5.8) show that the largest gains of the cited studies range between 0.9 and 1.9 plus. As shown in table 5.7, the effect sizes of 1.48, 2.03 and 1.89 are equivalent to raising the achievement of an average student to that of the top 7%, 2% and 3% of each respective dimension[2], which mean the 21 student participants as a whole has achieved *significant progress* in learning photography.

Article (All meta-analyses)	Cited studies	Class level	Duration	Test type	Effect size
Guskey & Gates, 1986	No. = 25	Elementary Secondary	Not reported	L/S	0.2 – 1.9 +
Slavin, 1987	No. = 17	Elementary Secondary	5 wks. – 1yr.	L/S	-0.11 – 0.9
Kulik *et al.*, 1990	No. = 108	Elementary Secondary College	2 – 108 wks.	L/S/C	-0.22 – 1.58

Note. Cited studies: the total number of studies cited; L: Local; S: Standardized; C: Combined.

Table 5.8

[2] See a discussion of this interpretation in sub-section 'Problems of Definition and Interpretation'.

One possible explanation for these exceptionally high *ES*[3] figures relates to the research design, in which outcomes of the same students were compared and contrasted, namely that the student participants were essentially their own comparison group. In this project, the researcher did not gather student achievement data from a separate control group because he perceived that firstly the intervention was very different from previous classroom practice and secondly, he could not teach a 'controlled' class at the same time, possibly because of the effect of "uncontrolled dissemination", which meant involvement in this project had not only spread to all his classes[4], but had basically changed his views of himself as a photography teacher (William *et al.*, 2004: p.62). However, it is also reasonable to assume that the effect sizes obtained would have been augmented by the absence of a control group. Indeed, while two of the participants did possess certain skills (F233 & M610, see table 5.1) for the majority of the students, learning photography through Gestalt theory was a brand-new experience. In other words, most of the learners were novice photographers, and almost all the curriculum content was completely new to them. With almost all the students starting at this minimal level, it was more than likely that these large effects were to be achieved (Slavin, 1987: p. 203).

Another possible explanation for those extraordinary effects is that in this study teacher-developed tasks were used as criterion measures of student achievement. In Slavin's review of research on mastery learning (1987), he points out that the effect sizes found on teacher-prepared tests are consistently larger than those on standardized tests. This is supported by Kulik *et al.*'s finding that again the effect sizes on locally developed tests are greater than nationally standardized ones (1990: p.277, 285). This difference in results suggests to Slavin that teachers may be consciously or unconsciously 'teaching to the test', or that evaluators may be consciously or unconsciously biasing tests towards the content emphasized in the experimental program (ibid, p.290). However, in this project 'teaching to the test' and, moreover, 'test to the teaching' were exactly the approaches the teacher adopted to ensure that assessment tasks and teaching objectives were in alignment with each other (see 4.5.1; Webb, 1997: p.3-4). Taking this aim into account, the researcher believed that the self-developed tasks provided the best evidence on programme effectiveness because these tasks focused exclusively on the curriculum taught in the specific context.

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3 *ES*: Effect Size.
4 The research comprised one class in the pilot study, and two classes in the main study.

Problems of Definition and Interpretation

Although only the portfolio assessment was used as output, the very fact that it was specifically designed to be aligned with what the teacher had been teaching, gave him confidence that this measure had a high degree of validity in terms of what the researcher was trying to achieve. Nevertheless, there are problems inherent in the definition and interpretation of standardized effect size in the literature.

"While standardized effect sizes are more comparable than raw scores, and allow different assessments to be placed on a common metric, there are nevertheless significant problems of interpretation" (William *et al.*, 2004: p.63).

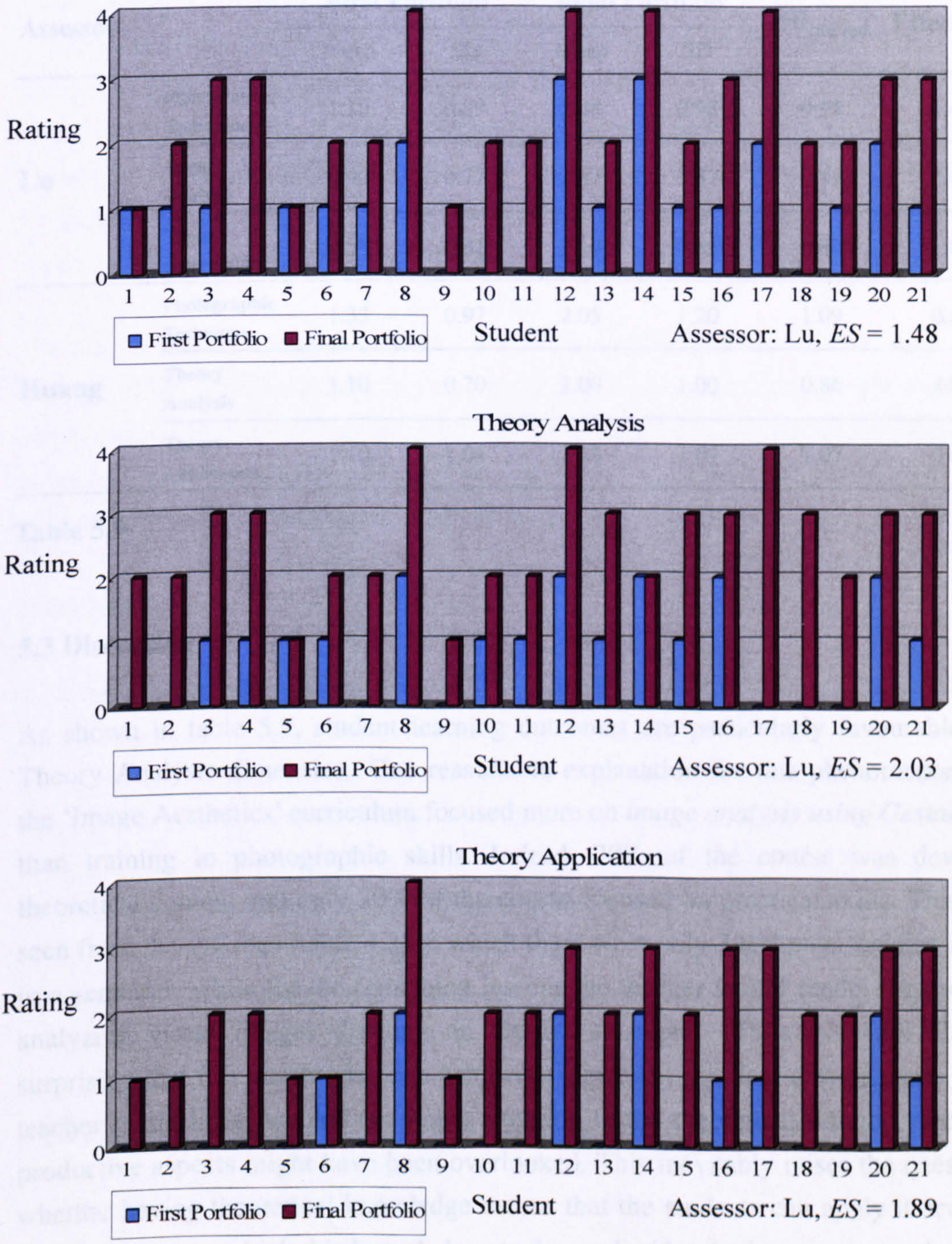
Dividing the difference between means by the pooled standard deviation (see equation 1) clearly makes sense in that, using a scale of 1-100, an improvement of 5 marks from 70 to 75 represents a great improvement if the standard deviation is 5 marks, but only a moderate improvement if the standard deviation is 20 marks. In the same way, using a five-point scale, an average improvement of a full point per student in a portfolio is to be regarded as a bigger effect if it is achieved in an all-novice class where the standard deviation is 1 point ($ES = 1.0$), than if it is achieved in a mixed-ability class where the standard deviation is, say, 2 points ($ES = 0.5$).

There is also the question of whether effect size represents the size of difference that distinguishes the individuals of one group from those of another (Favreau, 1997). She points out that given the effect size, we are still uncertain as to whether all individuals differ substantially or moderately from those in a comparison group. It is possible that if the researcher had a few superior students, their 'success' would have clouded the other students and given the illusion of a large effect. Although an effect size measure does not purport to interpret the individual differences, this is not to disregard the importance of knowing where these differences lie. Graphical presentation of the raw information is helpful in addressing the above problem by visually interpreting where the differences lie and discerning the patterns of scores (see figure 5.3). However, the use of this simple technique is likely to be limited to a relatively small sample size.

Moreover, it should be noted that the interpretation of effect sizes in terms of percentiles depends on the assumption of a normal distribution of scores. In this study, the scores were not normally distributed in most cases except for Huang's results of the final portfolios (see table 5.4), therefore it might not be entirely appropriate to interpret the results using percentiles. Using Lu's mean scores, compared to the individual scores

of the first portfolios (see table 5.1), the scores of the final portfolios of 2.48, 2.57 and 2.14 (see figure 5.2) are equivalent to raising the achievement of an average student, i.e. the one ranked 11th among the 21 participants, to that of the 3rd, 1st, 1st ranked student of each respective dimension, and these are indeed extraordinary positive effects.

Figure 5.3



Two important issues that arose from the assessment results have yet to be addressed. The first is that according to the results of the two assessors the effects on Theory Analysis are noticeably bigger than the others (see table 5.9), and the second is that there are apparent discrepancies between the sizes of effect of Lu and Huang, namely that the effect sizes of Huang are consistently smaller. These issues are to be addressed in the following section.

Assessor		First Portfolio		Final Portfolio		SD_{pooled}	Effect Size
		Mean	SD	Mean	SD		
Lu	Photographic Technique	1.10	0.89	2.48	0.98	0.94	1.48
	Theory Analysis	0.90	0.77	2.57	0.87	0.82	*2.03*
	Theory Application	0.57	0.81	2.14	0.85	0.83	1.89
Huang	Photographic Technique	1.33	0.97	2.05	1.20	1.09	0.65
	Theory Analysis	1.10	0.70	2.00	1.00	0.86	*1.05*
	Theory Application	1.10	1.04	1.76	1.09	1.07	0.62

Table 5.9

5.3 Discussion

As shown in table 5.9, student learning outcomes are particularly favourable to the Theory Analysis dimension. One reasonable explanation for this phenomenon is that the 'Image Aesthetics' curriculum focused more on *image analysis using Gestalt theory* than training in photographic skills. Indeed, 70% of the course was devoted to theoretical content and only 30% of the course focused on practical skills. This can be seen from the syllabus (table 4.2) in which there were only 3 technical training sessions in a semester, while for the remaining lessons the teacher would model the process of analyzing visual images drawing on Gestalt concepts. Thus it is not altogether surprising that this result has been achieved. However, this fact also suggests that the teacher might have devoted too much attention to the theoretical training, and certain productive aspects might have been overlooked. This inevitably raises the questions of whether having theoretical knowledge means that the students can apply it accurately, and the extent to which this knowledge can be applied by the learners to produce better work. These are the subjects for a detailed discussion in the next chapter.

In regard to the difference in effect size between the two assessors, this issue is addressed in two aspects of the portfolio assessment. To begin with, compared to Lu's results, Huang's mean scores of the first portfolios are visibly higher, while those of the final portfolios are noticeably lower, which mean a smaller 'gap' between the first and the final performance outcomes (see table 5.9). In other words, the students have achieved a less significant success from Hang's point of view.

Next, Huang's standard deviations (pooled *SD*[5], see table 5.9), the spread of scores around the mean, are consistently greater. In general, the larger the *SD*, the greater the spread of scores; the smaller the *SD*, the narrower the dispersal of scores. Although standard deviation tells us nothing about the pattern of scores, it provides a measure of variability which lies at the heart of the study of group differences (Burns, 2000: p.48). In view of this variability, Huang's results show a wider range of variation for the sample within each assessment dimension.

Dividing a smaller mean difference by a larger standard deviation, it is quite obvious that the effect sizes of Huang are smaller (*ES* = mean difference/*SD*, see equation 1). Nevertheless, Huang's effect sizes of 0.65, 1.03 and 0.63 are equivalent to raising the achievement of an average student to that of the top 26%, 15% and 26% of each respective dimension, which are very positive effects indeed.

5.4 Summary

In summary, this chapter has presented the positive effects of learning photography, the limitations of interpreting these effects, and the discrepancies in the effects among the three assessment dimensions and between the two assessors. Analysis of the portfolio assessment results has not only provided concrete evidence to answer the first subsidiary research question: "Is image analysis effective in developing students' ability to appreciate and produce photographs?" but also has practical implications for effective photography teaching in the near future. In short, from the teacher's perspective, the students have made substantial progress in the productive aspect as well as the appreciative aspect of photography, which justifies the teacher's intervention in terms of its effectiveness. As to the participants' learning experience of Gestalt theory and their thoughts on the course, i.e. issues from the students' perspectives, they are addressed in the following chapter.

[5] SD stands for Standard Deviation.

Chapter 6 Findings and Interpretations: the Students' Perspectives

Having presented the analysis of student portfolios in Chapter 5, this chapter will continue the enquiry into the participants' thoughts on the photography course 'Image Aesthetics' and in particular their learning experience of Gestalt theory. The basis for the curriculum rested on the Gestalt laws of perceptual organization. Considerable attention was devoted to Gestalt training in order to develop students' ability to appreciate visual images and produce desirable photographs. Nevertheless, technical training still accounted for approximately one third of the curriculum, in an attempt to avoid an imbalanced, theory-led course. The purpose of the present chapter is therefore to identify the factors which enable the researcher to address the following three research questions:

- Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography?

- What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory (2^{nd} subsidiary research question)?

- Have students' learning experiences of Gestalt theory influenced their image composing processes? (3^{rd} subsidiary research question)?

These questions need to be addressed from the students' perspectives, that is, to analyze what the students said in the diaries about their learning experiences. A detailed analysis of the 21 participants' diaries was performed using Thematic Analysis (Boyatzis, 1998), through which a total of 5 major themes and 14 subsidiary themes[1] were developed for the purpose of resolving the above research questions. These are the themes which express the students' common experiences in learning photography, including their response to course activities, experiences of learning photographic skills and Gestalt theory, reflections on the application of Gestalt theory, and ideas about artistic perspectives, which will be discussed respectively in the order they are presented in table 6.1. Although these themes emerged from the researcher's analysis of the diary data, they were all informed by the literature (e.g. Nunan, 1992; Bailey, 1991; Arnheim, 1974).

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[1] Readers are referred to Appendix E, Part B for definitions and examples of the 5 major themes and 14 subsidiary themes.

In order to structure the analysis and present the findings, a format that combines quotations with explanation and analysis is adopted, that is, a number of passages from the student diaries are quoted as supporting evidence as the researcher discusses and explains a recurrent theme. While only parts of the diaries were directly related to Gestalt theory, all of the quotations help readers gain an understanding of how the diarists experienced the course.

Major Theme	Subsidiary Theme
General response to the course (6.1)	• Course activities • Thoughts on non-Gestalt content • Character of the teacher • Teacher approval • Comments on personal progress
Photographic technique (6.2)	• Technical difficulty • Technical development
Image appreciation (6.3)	• Subjective judgment • Difficulty with theory • Understanding of theory
Application of theory (6.4)	• Acute sense of observation • Reflection on applying theory
Artistic perspective (6.5)	• Having an intention • Art appreciation

Table 6.1 The final (6^{th}) version of the coding system (see Appendix E).

6.1 General response to the course

This theme is used to synthesize the students' thoughts on 'Image Aesthetics' in terms of course activities, non-Gestalt course content (e.g. photographic skills and teaching methods), character of the teacher, teacher approval and comments on personal progress. These are the subsidiary themes which will be discussed respectively in detail in the following subsections.

6.1.1 Course activities (20/21)[2]

To achieve a better effect on learning, the teacher devised a total of 5 types of course

[2] **(20/21)** means that 20 out of the 21 diarists expressed their views on this theme.

activity, namely extracurricular consultations, group discussions, photography sessions, photography seminars and a midterm presentation. Strictly speaking, the extracurricular consultation was not part of the course as those meetings were carried out regularly on Tuesday nights instead of class hours. A time frame of these activities is presented in table 6.2 in the order in which they occurred during the target semester. The students' thoughts on these individual activities are reported and discussed below.

Activity \ Week		wk 1	wk 2	wk 3	wk 4	wk 5	wk 6	wk 7	wk 8	wk 9	wk 10	wk 11	wk 12	wk 13	wk 14	wk 15	wk 16	wk 17	wk 18
Extracurricular consultation		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
Group discussion		V	V		V	V	V	V				V	V	V	V		V	V	
Photography session	workshop		V					V							V				
	outdoor session			V							V					V			
Photography seminar					V							V					V		
Midterm presentation									V	V									

Table 6.2 A time frame of course activities. wk: week.

- Extracurricular consultation (4/21)

As the consultation session was so much in demand in the pilot semester and the target semester, to the researcher's surprise, only 4 students gave their personal views on the extracurricular consultation, and there were positive responses as well as negative ones.

> "I showed the teacher some of my photographs that night, and [through the discussion] I became aware of my own shortcomings. ... [While waiting for his turn to discuss his assignment with the teacher] I got the chance to view some of my classmates' photographs. Listening to the teacher's instruction and his comments [on different students' work], I really learned a lot of things. In fact, I have realized that it is also quite educational just viewing some good works by other people" (M009, Week 4~5).

It is clear from this comment that the extracurricular session was not just about positive reinforcement and development of confidence. M009 thought that during the consultation he became aware of his own shortcomings through the discussion with the teacher. He found that observing the discussions between the teacher and other students was also very helpful, because he could learn from the works of his

classmates. However,

> "This week, I had an [extracurricular] consultation with the teacher. This time, it was about the review of my photography assignment. I did not feel that I had learned anything special in this meeting. Problems relating to exposure, theme, etc had occurred repeatedly..." (M520, Week 6).

M520 held that the consultation was not very useful, because problems of both incorrect exposure and a lack of intention in his photographs had yet to be overcome. However, it seems that being unable to obtain perfect exposures may suggest that M520 would need a lot more practice to deal with this recurring, technical problem. Regarding the reason why the students tended to ignore this issue, the researcher can only speculate that perhaps the extracurricular consultation was not held in class hours, and therefore not all the students were able to attend.

- Group discussion (4/21)

Four students responded positively to the group discussions, in which they were able to exchange ideas with their classmates in an interactive atmosphere. Two typical examples are as follows:

> "I still enjoy the interactive atmosphere of this course very much. I also like group discussion in which I can express my own opinions and listen to other people" (M048, Week 3).

> "I feel during the group discussions, the members of my group often put forward very good ideas that I hadn't thought about. I believe this is the major advantage of group discussion which makes this course more diverse and interesting. I have also gained some unexpected but useful knowledge" (M632, Week 3).

Idea-sharing was a recurring theme in both M048 and M632's accounts, in which they shared a positive view on the group discussion. M632 believed that an exchange of different views helped to make the course more diverse. By comparing his views with those of his classmates, he could "make progress through sharing" (Week 1). However, time allocation for the group discussion was sometimes limited by the teacher's lecture (see table 4.4). As regards this limit, a student once expressed his feelings:

> "Today, our teacher asked us to judge the quality of five selected pictures. It was a shame that the time was too short for the [group] discussion as I could barely finish looking at them myself" (M616, Week 1).

As to whether the time was enough for group discussions, it usually depended on the subject matter and the number of students in a group. In this case, M616 referred to a session while the teacher asked his students to rank 5 sample photographs in order of quality, with many factors such as exposure, theme, and composition needing to be taken into account. It is certainly true that it took a great deal of their time to accomplish the given task.

- Photography session (17/21)

The main purpose of the photography session[3] was to provide opportunities for students to operationalize the theories and techniques they had learned in the classroom. Of the 21 student participants, 16 said this activity was highly beneficial to their learning.

> "I realize that I spent too much time practising depth of field [in the photography session] so that I rarely took into account the concept of [Gestalt] grouping in my pictures ...; however, the benefit of hands-on practice is especially impressive and efficient for the learners" (M316, Week 4).

M316 held that practice made perfect, which helped him become familiar with new techniques such as the control of depth of field. Moreover,

> "It is especially helpful to *practise concepts that we have just learned*! This will ensure that we find out whether we have fully understood the newly learned concepts and also will help us to discover the difficulties of hands-on operation" (F042, Week 7).

> "We then learned about perspective. It seemed to me that *being able to practise right after the instruction* was a great thing. Because it would reinforce the notions that had just been learned, and the teacher would also offer the help necessary for us to make progress more rapidly" (M573, Week 7).

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[3] The photography sessions included outdoor sessions and indoor/outdoor workshops, and the workshop was carried out a week before the outdoor session as a preparatory lesson (see table 6.2).

Both F042 and M573 shared this view that being able to practise immediately after the instruction was very helpful in reinforcing newly learned notions and addressing certain hands-on problems. It was a common theme among the participants (12/21) that the in-class workshop had a better effect than the stand-alone outdoor session. Usually the workshop was held in class straight after the lecture, that is, the third lesson of a class. Since the course content was still fresh in the students' minds, it was quite possible for them to combine photographs with theories. Below is another typical example.

> "After two lessons, we stepped out of the classroom in our last lesson so that we could apply the things we had learned in the class. Outdoor class was very exciting and we could also easily apply the newly learned concepts when they were still fresh" (F115, Week 8).

Hands-on activities such as the photography workshops required a clear demonstration by the teacher and plenty of time for the students to practise certain skills. When there was insufficient time given to a workshop, the students were not able to acquire the necessary knowledge for the outdoor session next week. On one occasion a student commented:

> "Later [in the class] the teacher let us play with digital cameras with manual shutters and apertures. However, this session was too short so I did not get a full picture of it. I hope there will be more detailed instruction in the next photography session" (F214, Week 3).

In summary, the photography session may need to be run in a 'eat less but more frequently'[4] mode in the future. That is, the number of stand-alone outdoor sessions should be reduced and replaced by more frequent in-class workshops. For instance, it might be better to have 5 to 6 photography sessions in a semester, with each session being held in the second half of a class.

- Photography seminar (13/21)

The photography seminar had a complementary role to the photography session, and it was conducted a week after the outdoor session (see table 6.2). Six to eight student assignments were randomly selected by the teacher for a seminar, in which he would perform a detailed, analytical exposition for each piece of the student work.

[4] This is a phrase frequently used by a number of doctors in Taiwan as a warning to diabetic patients.

During the process, attendees[5] and the other students were free to express their opinions about the subject matter. For those attendees, the seminars were helpful in addressing the problems they had overlooked.

> "[Luckily] I received an email from the teacher today. I was notified that my assignment would be discussed in today's class. The teacher pointed out the shortcomings in my photographs so I could make progress next time – especially *the habit of central positioning*. I don't think I would ever have known about this problem had the teacher not pointed it out to me" (M316, Week 5).

> "I was a little nervous when my work was discussed in front of my classmates. However, this allowed me to know about my shortcomings and helped me to improve. During the discussion, I found out about a major problem '*out of focus*' which I had not noticed before" (M632, Week 5).

Discussing the mistakes in individual work of students clearly has some risk of embarrassing them but both responses here were positive. They both agreed that the open discussion helped them find out about some hands-on problems such as the habit of central positioning and lack of correct focus, which enabled them to make further progress.

With regard to the students who only sat in on the seminars, two of them stated that they could learn from the good examples and mistakes of the attendees.

> "Today's photography seminar was very helpful to me, although my coursework was not discussed publicly. I also had the problems of central positioning and over-filling the frame. In addition, I often ignored the grouping [of visual elements] when I pressed the shutter. After today's discussion, I now have a better idea of what to do next time" (F042, Week 5).

> "After I spent more than one hour looking through my classmates' work, I found it very interesting. I got to see everyone's compositions and their ideas about how to analyze photographs so I could learn from their strengths and weaknesses" (F233, Week 5).

During the seminar, F042 recognized that she had made the same mistakes as her classmates, and realized that this would be useful for future improvement. On the

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[5] An attendee was someone whose assignment was discussed publicly in a photography seminar.

other hand, F233 made an important point that from the works of others she could gain different perspectives on photographic composition and image analysis.

- Midterm presentation (15/21)

The midterm presentation was a major assessment procedure carried out by the teacher to assess student progress in the middle of the target semester. More than half of the diarists (12/21) stated that the presentation was a useful approach to learning photography both in presenting one's own work and viewing the work of others.

> "In fact, I believe that being able to share my own photographs with others, regardless of the quality of image or the levels of skill, anything that has been photographed with genuineness can be considered as a good picture. It is truly a blessing to be able to share with others my final result" (M048, Week 8).

M048 held that presenting one's own work was an enjoyable experience, regardless of whether the photographs were good enough. Moreover,

> "It was very interesting to listen to other people's presentations which would always give me new inspiration or different perspectives" (F233, Week 7).

> "The most interesting thing about watching classmates' presentations is that from other people's work, you are likely to gain a different perspective on even the most familiar places in the campus" (F533, Week 8).

Being able to gain new perspectives was a theme common to a number of diarists (6/21). In the case of F533 and F233, they held a similar view that listening to others' presentations broadened their horizons, giving them fresh inspiration and perspectives. They both used the phrase 'different perspectives' but in slightly different ways. F533 appeared to refer to the impact of photographs in providing a fresh view of familiar places, whereas F233 was speaking more generally. F233's statement echoed the arguments she made about the benefits of the photography seminar in the previous section.

In addition, 6 students emphasized the importance of the teacher's feedback during a presentation. Here are two clear examples.

"I feel that it is a great experience because the teacher would offer immediate feedback to the presenter on stage. For me, the feedback is very helpful so I can make further improvements when I review my own photographs" (F042, Week 8).

"In addition, when a classmate was giving a presentation, the teacher would remind us about the overall composition of a picture that I found very helpful in deepening our understanding" (M048, Week 9).

However, assessing the performance of student presentations was a formal assessment procedure, in that the teacher would not provide detailed feedback or performance judgment on their tasks. F533 expressed her disappointment with this in the following excerpt.

> "It was a pity that the teacher did not offer some feedback in class for the sake of fairness. The teacher would only step in occasionally. Had the teacher offered more feedback, I believe I could have learned much more from the photographs of my fellow classmates" (F533, Week 8).

F533 thought that it was regrettable that the teacher did not give more constructive feedback on the presentations, otherwise she would have learned much more from the work of others. There was no contradiction between F533 and F042's ideas (see the previous page), because the teacher would only put forward practical suggestions when the topic was closely related to course content, whereas he would avoid giving performance appraisals to the presentation.

6.1.2 Thoughts on non-Gestalt content (20/21)

A number of students (4/21) tended to perceive learning photography as learning photographic techniques at the beginning of the course. When they realized that the curriculum focused more on theoretical analysis of visual images rather than training in photographic skills, the immediate response was one of surprise. After a period of adjustment, there seemed to have been a gradual shift in their mindsets.

> "The teacher has emphasized that this is more than a photography course. This is a course of aesthetics based on the theory of Gestalt psychology. At first, *I found this hard to accept*. However, as cameras nowadays are equipped with so many functions, you are just a switch away from various modes. We don't really need a

course to learn how to take pictures" (M641, Week 1).

"In recent classes towards the end of the semester, I have come to realize the importance of composition. When I started to learn photography, *I only cared about techniques.* However, I now pay more attention to the *characteristics of the subjects* and *background.* My techniques have gradually become mature so that I can achieve a better effect more precisely. Nonetheless, I still need to improve my *sense of observation* as I tended to spend too much time in choosing an appropriate angle when taking pictures" (M632, Week 16).

In short, a few students seemed to have a clear picture in their minds that learning photographic skills was the major objective for taking the course. Therefore, it had surprised M641 to find that the course was actually the other way round, that is, only one third of the curriculum was devoted to technical training. As the course proceeded towards the end of the semester, learning technique was no longer M632's main concern. Instead, he then believed that composition and powers of observation should play a more important role in taking photographs.

The teacher developed numerous interactive PowerPoints in connection with a wide range of the curriculum content, in the hope that by combining texts with diagrams, pictures and animations to analyze visual images, the intended teaching objectives would be achieved. Many diarists (6/21) responded positively to this teaching method.

"The teacher explained the effects and basic concepts of shutter, aperture, ISO and white balance. I especially enjoyed the PowerPoint made by our teacher. Without the PowerPoint [animated slides], I would still think that the shutter consisted of only two movable flaps. Thanks to the teacher's clear explanation, I managed to stay awake through the entire number-loaded course" (M616, Week 3).

"Today we went through a lot of pictures provided by the teacher [examples on the PowerPoint and the handout]. These pictures were helpful for us to memorize the course content. I realize that good examples [pictures] are very important as texts were sometimes too theoretical to understand, and therefore will be soon forgotten. On the contrary, good examples will improve learning efficiency" (F937, Week 16).

Photography is a powerful, visual medium, in which a picture is worth a thousand words. Using carefully chosen pictures to explain theoretical concepts was very helpful for the learners and enabled them not only to understand the concepts but also to memorize the curriculum content. M616 thought those animations were highly effective in helping him understand the structure of a camera shutter. In other words, only seeing is believing. On the other hand, F937 believed that pictures in PowerPoint presentations and handouts helped her fully grasp the theoretical notions, whereas texts were at times difficult to comprehend and therefore to remember.

Although technical training was not at the core of the course, practical issues such as photographic skills and composition were among the most popular topics that many students (8/21) noted in their diaries. For one thing, training in photographic skills still accounted for approximately 30% of the curriculum, during which time the students had ample opportunities for practice and self-reflection. For another, the practical issues were not difficult to comprehend and through independent practice the intended outcomes, to a certain degree, could be achieved. Typical subjects such as the use of perspective and the rule of thirds were common themes in their diary entries.

> "In today's class, we discussed our first photography coursework and some principles of composition such as the rule of thirds, chiaroscuro as well as the habit of central positioning. ... I found these concepts very inspiring" (M005, Week 5).

> "Today the teacher talked about perspective which was frequently used as visual clues in a picture that helped us further perceive the sense of depth, such as [the use of] linear perspective, shadow and overlap etc. I feel that I can easily understand this part as there are many phenomena related to perspective in our daily experience. What we did today was to attempt to construct the concept of perspective in a more disciplined way" (F533, Week 7).

F533 explained that as perspective was part of our daily experience, this might well have been the reason why she could easily understand the concept.

In sum, although Gestalt theory is helpful in interpreting the composition of images, well-developed skills are essential to the creation of desirable photographs. Therefore, the content and percentage of the practical classes, such as photography workshops and outdoor sessions, definitely deserve further consideration for the coming semester.

6.1.3 Character of the teacher (9/21)

As the course progressed, in addition to entries on their learning experiences, many students (9/21) would note down how they felt about the teacher and furthermore how the teacher had influenced them.

> "At the beginning, I felt that the teacher was not very approachable. However, after one class, I realize that he is very patient and humorous, and has a strong sense of responsibility towards his own course. Therefore, I am more determined to take this course" (M641, Week 1).

> "Our teacher is really a very hardworking and conscientious teacher. I believe all of us enjoyed this course like I do. I don't think I have ever taken any GE [General Education] course in which the teacher can memorize everyone's name. I must say even the teachers in our own department rarely achieve this. [The teacher took everything] such as teaching materials and extracurricular consultations seriously, and he even lent his own cameras to us during the photography sessions. In fact, I haven't met such an enthusiastic teacher as him since I entered college" (F115, Week 18).

It is clear that the teacher's conscientious approach to his work had had a positive impact on M641's willingness to take the course. On the other hand, F115 seemed particularly responsive to the interpersonal style; she gave a number of reasons why she preferred the teacher, namely that he was familiar with all the students, serious about teaching and generous with his equipment. The fact that the teacher could remember her name, among other classmates, made her feel that he had "acknowledged her existence and took her seriously" (Week 18). However, to avoid 'pleasing the teacher' (Jarvis, 1992: p.137), F115 made an additional statement:

> "Since I am not writing to *please the teacher*, I would also like to make a suggestion to him. Sometimes, when I raised a question, the teacher would interrupt and start to answer my question before I even finished asking. Thus, the teacher might give an answer that was irrelevant to my question. I think the teacher is a very 'interesting' person, since taking picture requires patience – I sometimes feel that perhaps he is a bit impatient" (Week 18).

'Pleasing teacher' responses were not at all uncommon in similar diary studies (Barley, 1983; Jarvis, 1992), in which learners sometimes appended evaluative comments in

their records. With reference to diaries in this study, a few students (3/21) added remarks such as "I have learned a lot in this semester" (F371, Week 17), or "This is the best course in my university life" (M005, Week 16) without any justification for the evaluations. It seems that these learners were grateful to the teacher but did not provide any in depth reflection of themselves or of the course. Jarvis suggests that we may ask the diarists to give reasons for their appraisals (1992: 137).

In a particular case, M009 seemed to perceive the teacher as a role model. He wrote:

> "Many people may admire the teacher's acute sense of observation. However, what you see in the eyes is only the surface; the most valuable things embedded within are the teacher's relentless pursuit of art and his aspiration to the beauty of life. I believe these are what I really want to learn in this course" (M009, Week 3).

Judging from the literal meaning of the words, it seems that M009 hoped to emulate the teacher's personal values regarding photography and art. This can be seen in Erkut & Mokros' study in which the personal values of role models have somewhat of an influence on college students, but the influence is not significant (1984: p.409-410).

6.1.4 Teacher approval (5/21)

Words of praise from the teacher served two main functions. The first was to boost student confidence, and the second was to improve learner motivation. These are best exemplified in the following examples.

> "I was so happy that my panning photos were approved by the teacher. I was worried that my work was too simple because I only practised this technique. However, I could not have agreed more when the teacher reminded me to just 'do your best one thing at a time'" (F533, Week 11).

> "I was so touched when the teacher approved of my work. I still cannot believe this is true. I feel that my hard work has finally paid off, and I enjoy so much the sense of accomplishment. Indeed, I know that I have improved over time as my first assignment was so bad that I was afraid to show it to other people" (F937, Week 18).

Both F533 and F937 were gratified to hear the teacher's words of encouragement, feeling a sense of accomplishment after a great deal of effort and hard work. However, when there was insufficient praise or supportive feedback given to student tasks, they might have been demoralized. An example from the presentation weeks (Week 8 & 9) of the course reads:

> "I think I did a good presentation today. However, I could not tell if I had made any improvement. The teacher only explained the theme I wanted to express and the points I overlooked during the performance. But I actually wanted to know about whether the teacher approved of the way I presented my concept! For me, a nod from the teacher is like getting a perfect score! On the other hand, I would have to change my style if the teacher did not approve of my work" (F214, Week 9).

Reading between the lines, F214 was quite disappointed with the teacher's feedback on her task. Instead of receiving comments on the theme and content of her presentation, she was actually seeking approval from the teacher. The teacher's approval would have given her a sense of fulfilment similar to scoring full marks in an examination. This somewhat reflects the importance of teacher approval to improving student motivation.

An interesting fact to note is that all the responses which valued the teacher's approval were from females, accounting for 62.5 percent of the female diarists (5/8). On the other hand, males, who accounted for 61.9 percent of the 21 participants as a whole (13/21), did not refer to this issue at all in their diary entries.

In a study carried out by Butler (1987) that examined the effects of four kinds of feedback, namely *comments*, *grades*, *praise*, *no feedback*, on the performance of 200 grade 5 and 6 students in divergent thinking tasks, although the four groups were matched on pre-test scores, the students given comments scored one standard deviation higher than the other groups on the post-test (p.478). Interestingly, an end-of-session questionnaire survey showed that those given praise had the highest perceptions of success, even though they had been significantly less successful than the *comments* group. This echoes the findings of Cameron & Pierce, who found that while verbal praise and supportive feedback can increase students' motivation for and attitude towards a task, such feedback has almost no effect on performance (Black & William, 1998: p.50). In summary, the researcher believes feedback should focus on providing information about the gap between the actual level and the reference level

of task performance which is used to bridge the gap (Ramaprasad, 1983: p.4). However, a balance between the two types of feedback, information and praise, requires thoughtful consideration perhaps in individual cases.

6.1.5 Comments on personal progress (15/21)

The learning process in the target semester can be roughly divided into three phases, that is, an initial phase (Week 1 – 6), an intermediate phase (Week 7 – 12), and a final phase (Week 13 – 18). In the first two phases, more than half of the diarists (11/21) were either dissatisfied with their progress or anxious about competing with their classmates. Two representative examples read:

> "I enjoyed everyone's presentation. Each presentation illustrated a very clear theme. To be honest, I often do not know what my theme was or what I wanted to express [in my pictures]. I think *I need more practice*" (M616, Week 8).

> "I felt under pressure when I noticed the gap between myself and my classmates. I also became less confident when giving a presentation in that I used lots of auxiliary words such as 'ah', 'bah' and 'mah' etc. I cannot help to feel that I am so much behind and there is a lot I need to do in order to compete with others" (F937, Week 9).

As a student feels unable to compete with others, this self-perceived inability can lead to anxiety. Although this anxiety may cause the learner to withdraw, it may also lead to active competition, either through increased personal efforts to master the subject matter or through striving to outperform other students (Bailey, 1983: p.95-96). These were best exemplified in M616 and F937's words: "I need more practice" (Week 8), "this forces me to work harder" (Week 18).

During the initial and intermediate phases, a number of students would make negative comments as well as positive ones on their own progress, but the former was much more frequent than the latter (see table 6.3). For example,

> "I feel terrible after my presentation. I still cannot fully master exposure after all this time. I should not be making mistakes such as over-exposure or under-exposure by now" (F533, Week 9).

F533 was particularly conscious of progress over time and was very disappointed that she lacked the ability to obtain a perfect exposure after spending much time on this. She found it "quite difficult" whether to use those wrongly exposed pictures for her presentation (Week 9). In a different case, one student wrote:

> "When preparing the pictures for my midterm presentation, I noticed my improvement. That is, I tended to think more carefully about what I wanted to show in a picture before making the first shot. The photos I took now seem to be a bit better than those in my first coursework" (F018, Week 8).

During the preparatory phase of her presentation, F018 realized that she was making progress because at the time she had a clearer sense of intention of taking photographs, and she felt that her pictures were of better quality than those in her first assignment.

Comments on Progress **Phase**	Positive	Negative
Initial Phase (Week 1 – 6)	0% (0)	100% (4)
Intermediate Phase (Week 7 – 12)	33.3% (5)	66.7% (10)
Final Phase (Week 13 – 18)	80.0% (8)	20.0% (2)

Table 6.3

As the course proceeded to the final phase, there was an increasing tendency for many learners to comment on their progress more positively (table 6.3). One student gave a brief summary of the course and commented:

> "I have learned much more in the course than I expected. I thought this course was only about taking pictures and taking more pictures. However, it turned out to be the opposite, that is, the teacher has made great efforts to introduce a wide range of photographic theories and has spent a lot of time in image analysis. I have not only gained a general understanding of these theories but also transformed from a layman into someone with basic photographic knowledge" (M048, Week 17).

In general, there was a gradual shift in many diarists' attitude in which they felt more confident about their own progress. This can be seen as an indicator which suggests that the course had a positive impact on their learning.

6.1.6 Summary

Generally speaking, the majority of the responses to the course in terms of the course activities, non-Gestalt course content, teacher's character, teacher's approval and comments on personal progress were very positive. However, responses were not universally positive: individuals did feel enough confidence to express negative views, such as M520 in 6.1.1 and F214 in 6.1.4. Clearly there were learners for whom certain parts of the course did not work (e.g. the extracurricular consultation) and their views need to be taken into account when providing a general evaluation of its impact.

6.2 Photographic technique

Findings from the diary analysis reveal that there were two phases in the writers' experience of learning photographic techniques. The first was an experimental phase in which learners had difficulty in perhaps obtaining perfect exposures or expressing intention in photographs because they were not familiar with certain necessary techniques. The second was a developmental phase in which, after continual practice, the learners were able to overcome the problems that had emerged in the previous phase. With regard to the whole learning process, the two phases repeated an experiment-and-development cycle, but there was no clear boundary between them. *Technical difficulty* and *technical development* are the major themes in the participants' writings about learning photographic skills, and these themes are discussed in the subsequent sections.

6.2.1 Technical difficulty (10/21)

Basic photographic skills such as the utilization of apertures, shutter speed and exposure are relatively simple in themselves, but it seems difficult for novice learners to synthesize these techniques flexibly to express their intentions. One of the topics in the second photography session was panning, which involves releasing the shutter while following the subject with the camera and is frequently used to suggest movement in a picture. This technique requires moving the camera at the same speed as that of the subject, and at the same time an appropriate aperture, shutter speed, exposure and even composition cannot be overlooked. A number of students (4/21) found this particularly difficult.

> "We first learned the panning technique under a cloudy sky today. The practice of panning was no better than the practice of perspective as I still could not

follow the moving subject smoothly and so always produced blurred images" (F042, Week 10; see figure 6.1).

"The teacher demonstrated panning technique [this afternoon]. To be honest, it was not an easy task. I often hoped that I would not produce pictures with central positioning. We first aimed at the centre, fixed the focus and then moved our subject to a different position in the frame while following the moving subject (it is moving!) with the camera at the same speed as that of the subject to avoid failure. In addition, we must not set the focus too early otherwise the subject would become out of focus [later]. Such a complex procedure indicated that we had to pay attention to lots of things within a short time" (M316, Week 10).

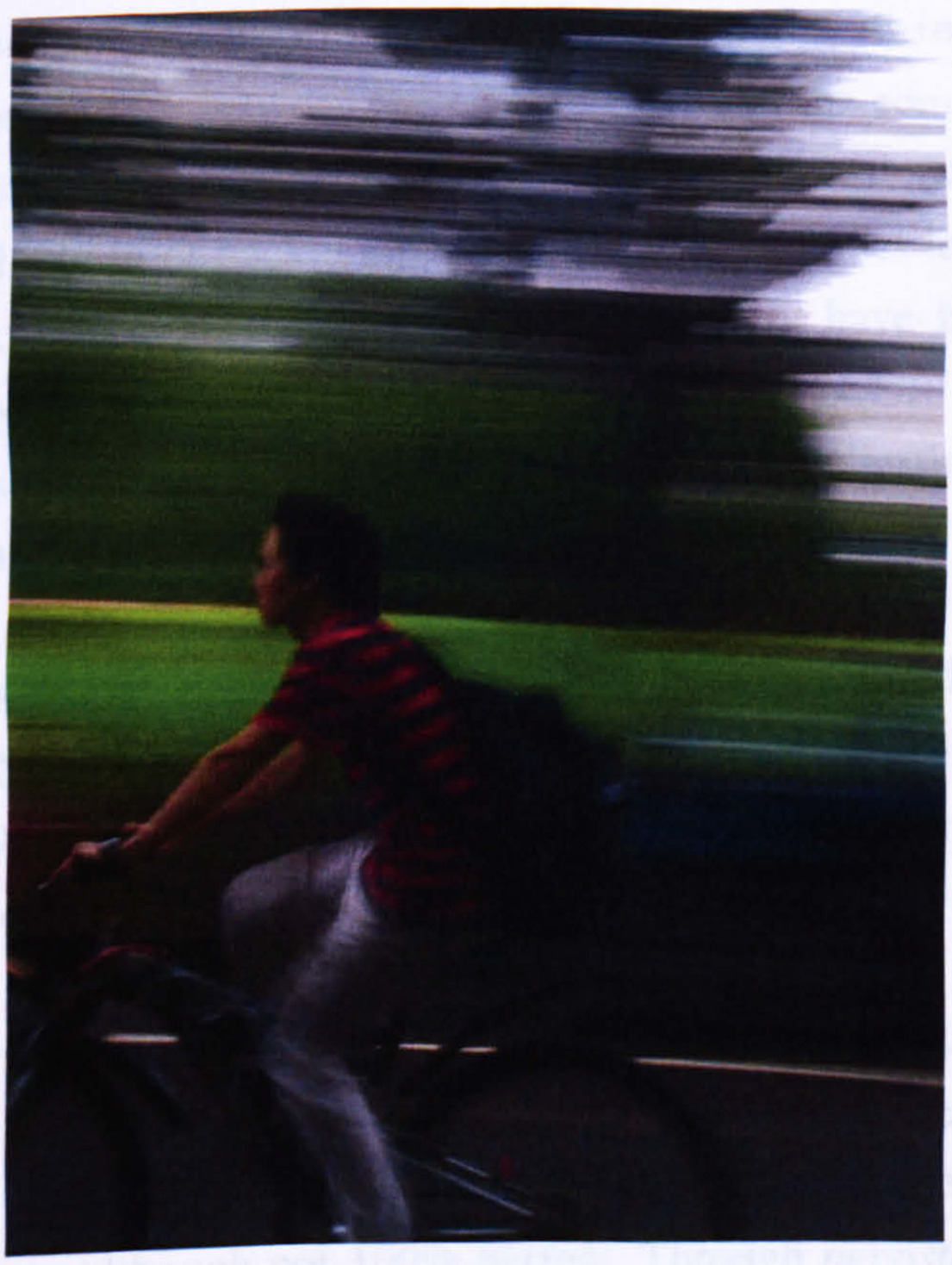


Figure 6.1 A sample photograph from the 2nd coursework of F042.

In a general sense, both F042 and M316 shared the view that to pan along and focus on the subject simultaneously were not easy, with M316 adding that central positioning also needed to be avoided in the final shot. Another recurrent problem (5/21) noted in the diaries was the decision and use regarding appropriate exposure.

"When reviewing the pictures I took today, there a re only a few that are of good quality. The colours of some photographs are not bright enough on the computer

screen, although I thought the exposures were acceptable when taking those pictures. This is obviously a problem of under-exposure" (F018, Week 4).

"It was not easy to estimate right exposures while taking pictures [in today's photography session]. Since a picture shown on the [camera] LCD[6] might be different from that on the computer, I had tried for quite some time to find better lighting [exposures?]" (F533, Week 4).

F018 and F533 were faced with a similar problem, that is, it was quite difficult for them to obtain perfect exposures. F018 recalled that judging from the images on her camera LCD, those pictures all seemed to have correct exposures. However, it was not until those photographs were shown on a computer screen that she realized most of them were underexposed. For one thing, there might have been a difference in brightness between the camera LCD and the computer screen, namely a difference in hardware. For another, some students occasionally increased LCD brightness in a dimly lit or backlit environment, which at times led to a misjudgment of exposure. For example, an underexposed picture might have been wrongly judged as appropriate because of the high brightness of the LCD. These issues can be addressed by juxtaposing a LCD with a computer and adjusting the brightness controls of the set until they look the same.

Although applying multiple skills flexibly to produce photographs might appear to be difficult, a number of students (5/21) held that through "continual practice" (M316, Week 10; M402, Week 7) this difficulty could be overcome. After acquiring a DSLR[7], one diarist gave a clear example:

"Since now I am using a manual camera, exposure has become a prerequisite that needs to be taken into account. My early works show clear signs of under-exposure. After constant practice and adjustment, I have got a grip of it, although not 100% perfect. Through *persistent and continual practice*, I believe that 'achieving perfect exposure' will become a kind of habit and reflexive response" (M009, Week 4).

A perfect exposure comes from understanding the pattern of light and shade in a scene and knowing how a photographer wants this to appear in the final image. Achieving the right exposure is not about reading what is there but about interpreting what is

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6 LCD: Liquid Crystal Display.
7 DSLR: a digital single-lens reflex camera.

there and setting an exposure that will deliver the photograph he or she is looking for. Judging from the above excerpt, M009 was quite determined to master this skill, or more precisely, this concept, and he believed persistent efforts are crucial to achieving that goal.

6.2.2 Technical development (10/21)

A high level of proficiency in photographic techniques is a prerequisite to producing the desired effect in a photograph. Basic skills such as the application of appropriate aperture and shutter speed are helpful for photographing everyday subjects. On the other hand, specific techniques such as multiple exposures and panning are used to convey the sense of movement in a still photograph. The latter, panning technique, is frequently used to suggest the moving state of a subject through metaphor, that is, background intrusions are rendered as streaks of colours. Two diarists gave clear examples of their learning experiences:

> "Some of my photographs do not have specific subjects but were produced for the purpose of practising the combination of aperture and shutter. We could raise the ISO value in combination with an appropriate aperture and shutter speed to give sufficient light to pictures taken in a dark room without using flash. This to me is a new technique. Without this new skill, I would probably use my flash like most people would do in a gloomy environment" (M048, Week 4).

> "I spent some time practising panning: got used to the speed of a bicycle by moving my hands at the same speed as that of the bicycle, and [at the same time] adjusted the focus. This practice was a very good experience. I shall learn to focus on one thing at a time and not to be over-ambitious. I think 'hand-feel' is very important [the feel of moving your hand with the subject smoothly]. Minor White [American photographer] sometimes practised taking pictures without films in order to familiarize himself with this feel. Several continuous shots in my coursework were made within a few minutes — once I got used to the moving speed of the subject, things simply became much easier" (F533, Week 11; see figure 6.2).

M048 realized that when taking photographs in a low light situation, flash might not be the only option. To compensate for the lack of light, he could increase the light sensitivity of the camera, that is, to raise the ISO, which would result in a more appropriate exposure. From the above excerpt F533 gave us insights into how we

were to obtain perfect panning shots, and she believed 'hand-feel' was the key to success. She further explained that hand-feel was the ability to move the camera with the subject smoothly, and it would be better to "rotate [move] your whole body instead of only moving your hands" (Week 10). Again, persistent practice is the key to success. Many diarists (7/21) had similar experiences as F533, for example, one student noted:



Figure 6.2 A sample photograph from the 2nd coursework of F533.

> "After making some panning shots, I found that most of the pictures had the problem of central positioning as I tended to set the focus in the centre, that is, the subject was always placed in the central position of a picture frame. This problem can be avoided by shifting the camera and moving the subject to a different position of the frame *a split second* before pressing the shutter release. This will result in a better composition" (M009, Week 10).

The problem of central positioning in a panning shot was common to many learners (6/21), as it was very difficult for novice photographers to pay attention to the moving subject and the composition simultaneously. Here, M009 suggested a solution to this problem by keeping the subject in the centre during the panning up to the moment of releasing the shutter. However, this might not be a practical approach to avoiding central positioning. As panning usually requires slow shutter speeds, such 1/15s or 1/30s, shifting the camera swiftly may produce blurred images because of camera shake.

6.2.3 Summary

In sum, issues relating to exposure and panning were the most frequent topics that the diarists wrote regarding photographic techniques (14/21). During the initial and intermediate phases[8] of the target semester, a number of writers (6/21) had developed various levels of awareness of exposure which would be crucial to their later development. An interesting fact to note is that panning was the most popular topic that over half of the learners (12/21) noted in their diaries. One possible explanation for this is that as panning requires a skillful use of mixed techniques, achieving a desirable effect would give them a strong sense of accomplishment. This was clearly conveyed in some of the writers' words. Another possible explanation for the reiteration of panning relates to its widespread use in wildlife and sports photography, in which it is used to "emphasize the moving state of the subject" (M610, Week 10).

6.3 Image appreciation

For the majority of the students, learning how to use Gestalt concepts to interpret photographs objectively was a brand-new experience. Since we "must try not to be influenced by our subjectivity so that we can look at photographs objectively" (F533, Week 3), this approach left some students with "lingering doubts" until the final phase of the semester (F214, Week 3). Given the fact that Gestalt theory cuts across the fields of psychology and physics, more than half of the learners (11/21) at times experienced difficulty either understanding the theory or applying the theory to analyze their own work. Nevertheless, most of the diarists (15/21) eventually developed a clear understanding of the theoretical content, and were able to provide concrete examples to demonstrate this understanding. These issues are further discussed in the succeeding sections on *subjective judgment*, *difficulty with theory* and *understanding of theory*.

6.3.1 Subjective judgment (8/21)

During the first few weeks of the semester, it seems to the researcher that only two subjective standards were utilized by the students to judge the quality of photographs. The first was the attractiveness of the subject in a picture. A number of diarists (4/21) expressed their preferences with regard to whether the subject itself was *attractive*. This is clearly conveyed in F214's words.

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[8] The initial phase: week 1 - 6; the intermediate phase: week 7 - 12; the final phase: week 13 - 18 (see **6.1.5**).

> "However, we still preferred the picture of the sunflowers and that of the ducks [2 pictures out of 5 provided by the teacher]. As I used to think, maybe everyone agreed that the most *attractive subjects* were those beautiful animals or flowers" (Week 3).

The second criterion for judging image quality was whether the viewers experienced a kind of 'feeling' in a photograph. An example from the first week of the course reads:

> "The teacher showed us a few photographs today and asked us to rank these pictures [in order of quality]. In addition, we were requested to write down the factors that might influence our judgment. To be honest, I did not know anything about aperture, shutter or exposure in the beginning and so I could only rely on my *feeling*s towards these pictures. What I did was to rank the pictures based on whether it could touch me [literal translation: give me a good feeling] or inspire a little more imagination" (M641, Week 1).

M641 admitted that the sole criterion he used to evaluate a photograph was whether the picture would give him a good 'feeling' or stir his imagination. Interestingly, this word 'feeling' repeatedly appeared in many learners' diary entries (7/21), such as "I could only evaluate a photograph by the feelings it gave me" (F042, Week 1). On further reflection, F533 held a somewhat similar view and clarified it a step further:

> "I have learned that in this course we must try not to be influenced by our subjectivity so that we can look at photographs objectively. This approach allowed me to spend more time looking at each picture carefully in an exhibition. However, I must admit that *the first sight* always determined how much time I was willing to spend on each photograph" (F533, Week 3).

Here, both M641 and F553 held that a good photograph would touch them intuitively, which relied very much on their subjective judgment. In view of this issue, Gestalt theory was introduced to mitigate the ambiguity of subjective response concerning the evaluation of visual images. The starting point of Gestalt theory is that with regard to visual images human beings respond to certain configurations of visual elements in a consistent way. In other words, our response to visual images is, to a certain extent, objective, and there exist common principles which are helpful in identifying the characteristics of works of art. Not surprisingly, a few students (3/21) found the use of objective principles to evaluate photographs hard to accept, because, as one of the

student said, "I could not free myself from the influence of my subjective response" (M520, Week 2). In relation to the discrepancy between subjective judgment and objective evaluation, F533 made a comment near the end of the course.

> "In the end, art seems to be a product of intuition as it involves personal *feelings and emotions*. Even with the best techniques, if you are not attracted by the work [photograph], you will not be able to appreciate it" (Week 16).

After being trained in Gestalt theory for a fairly long time, F533 still felt that she would not be impressed by a work of art if the work failed to stir her intuitive feelings at first sight. Although she did not make the meaning of 'feeling' clear, she seemed to refer to her subjective response to a piece of artwork. F553 later explained that she was not denying the objective function of Gestalt theory, but "a balance between sense and sensibility" could not be overlooked (Week 16).

6.3.2 Difficulty with theory (11/21)

In view of its objectivity and consistency, Gestalt theory was used as the basis for the curriculum. Theoretically, an in-depth understanding of the theory could be very useful for the learners to produce and analyze photographs. However, gestalt concepts at times seemed "too difficult" (F533, Week 2) for many novice learners to understand (7/21), which inevitably led to some misunderstandings. Below is a typical example.

> "Simplicity! It never occurs to me that human kind's basic instinct is to *simplify* the understanding of things on the basis of previous experience. I agree with this viewpoint in certain aspects but I don't think this idea can be applied to all kinds of behaviour. That is, if we interpret everything based on *the law of simplicity*[9], I don't think we would have so much fun in the world" (M616, Week 16).

From the perspective of visual perception, the law of simplicity, as its name suggests, places emphasis on the simple, harmonious relationship between visual elements in our visual field. This can be exemplified and explained in part by the following example.

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[9] **Law of simplicity** is what Gestalt psychologists describe as the basic law of visual perception: Any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the given conditions permit (Arnheim, 1974: p.53).

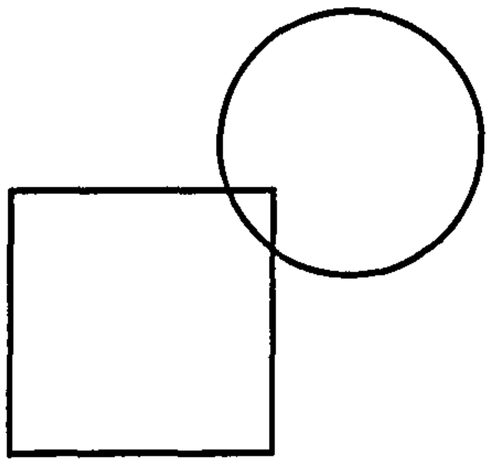


Figure 6.3

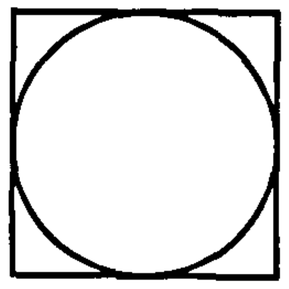


Figure 6.4

Figures 6.3 and 6.4 are made of identical parts, but 6.4 is the *simpler* pattern because the parts have a common centre, which means a simpler and more harmonious relationship between the square and circle (Arnheim, 1974: p.57)[10]. The law of simplicity attempts to describe the way we respond to the grouping of visual elements, but it does not impose limitations on our behaviour. M616's comments seemed to take the words 'law' or 'simplicity' too literally. In addition, the Chinese translation of the phrase 'law of simplicity', which carries the implication of simplification, is to some extent misleading. Another typical example of misunderstanding about Gestalt concepts is:

> "I am mostly impressed by the Zeigarnik effect[11]. For me, I can always remember the questions that I could not solve from subjects such as modern physics, quantum physics or engineering mathematics. For this reason, I can hardly agree with the handouts that memories of those will be soon forgotten. Personally, *unhappy memories always last for the longest time* [this is actually the meaning of Zeigarnik effect] such as tests, sad movies, wrong notes at concerts, losing games etc" (M005, Week 6).

The Zeigarnik effect states that we are more likely to remember unresolved tasks than completed ones, which is exactly what M005 said "unhappy memories always last for the longest time". However, this superiority of memory recall for uncompleted tasks does not last long, and seems to disappear within a short period of time (Zakia, 2002: p.57). It is obvious that M005 had misinterpreted the meaning of the effect. Judging from the above examples, what the students noted in their diaries were what they thought they knew and not necessarily what they had learned in class. Indeed, the diaries involved subjective opinions or responses, based almost entirely on the

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10 A full discussion of this issue is beyond the scope of this chapter.

11 The Zeigarnik effect is a variant of the Gestalt principle of closure (Zakia, 2002: p.58).

learners' perceptions of their experiences, and they were by no means objective reports (Bailey, 1991: p.79).

In contrast to the above examples, a few students (3/21) seemed to have little difficulty understanding Gestalt concepts, but found it difficult to apply the concepts to analyze their own work. There are two of the responses:

> "After the first photography session, I have become more familiar with the applications of aperture and shutter. However, while I was doing the coursework about the analysis of my photographs, I still found it difficult to describe precisely my feelings towards certain pictures" (F371, Week 4).
>
> "I feel that the theories introduced by the teacher in class are quite comprehensible. However, it is another story to analyze my own photographs by using these learned theories" (F937, Week 7).

F371's problems might relate to a lack of sufficient writing skills or a clear understanding of certain theories. On the other hand, F937 recognized that there was no direct link between having theoretical knowledge and using that knowledge to interpret one's own work. That is, it is one thing to say we understand a new concept; it is another to actually use that concept. This phenomenon also occurred during the pilot study. In view of this discrepancy, it may be beneficial to forward the sample portfolios of higher level of performance, namely a score of 3 or 4, to prospective students, in an attempt to ensure a better understanding of the analytical procedures for their work.

In a particular case, one student from the Chinese department wrote:

> In today's class [about the theories of Illusion and Ambiguity], I had a hard time understanding the concepts right away and it often took me a while to figure it out. I think part of the reason may relate to my humanities background. It then occurs to me that as a physics major, the teacher's background might be an advantage in learning these theories (F115, Week 17).

Several Rudolf Arnheim's classic writings, such as "Art and Visual Perception" (1974) and "Visual Thinking" (1997), were used as textbooks or reference books for the course. Arnheim frequently quoted and used numerous physics terms and concepts, for example 'physical forces', 'entropy' and 'dynamics', to explain the process of our visual perception. As regards the students with a humanities background, the lack of a

formal training in physics could to a certain extent have hindered their progress. However, among a total of 4 humanities students, F115 was the only diarist who raised this issue but eventually she managed to grasp the said concepts. It seems that the above-mentioned interactive teaching methods and text-with-illustration teaching materials (see 6.1.1 and 6.1.2) had achieved the desired effect.

6.3.3 Understanding of theory (17/21)

It is difficult to gauge the students' understanding of the theoretical content exclusively from their words. One reason is that the learning processes which the learners actually chose to write about were only a small subset of the entire range of learning processes (Bailey, 1991: p.80). Another reason relates to the problem of 'listing' or 'reiteration', in that the researcher is faced with real difficulty in judging the diarists' learning experiences. An example from the 14th week of the course reads:

> "The most impressive part of this week's lessons is [the concept of] motion parallax. The teacher explained the concept with a well-known Chinese poem, which made it very easy [to understand]. In addition, the teacher also introduced colour theories and the concept of visual weight" (M048).

Listing or reiteration seen in the diaries has also been found in similar studies (e.g. Jarvis, 1991: p.136). Jarvis argues that some diarists may fear loss of face before their tutor if they appear less knowledgeable, therefore a list of things would provide a way of fulfilling the task without the danger of offering one's own opinion (ibid). It is also possible that a certain learners may prefer to 'flow into a mould', and reiterate the course content, rather than reveal his or her own views by self-exposure or introspection. Judging from M048's words, it is hard to see any sense of reflection on learning emerging. Nevertheless, most of the diarists (15/21) had little difficulty in providing concrete examples to show their understanding of Gestalt concepts. Here is a perfect example:

> "In the discussion [of the concept] of an *equivalent*, an anecdote came to mind in which Van Gogh was the main character. Van Gogh once took a piano lesson and when he pressed a key, he exclaimed with excitement: 'Ah! *This sound is as blue as the sky!*' I assume Van Gogh's remark can be considered as an example of equivalence" (F042, Week 12).

American photographer Alfred Stieglitz in the 1920s photographed clouds that, for him, evoked feelings similar to those that arose from listening attentively to classical music; visual and auditory sense became equivalent. Photographs that stimulate this kind of association are called *equivalents* (Stieglitz in Thomas, 1983: p.11).
"In simple terms it is the ability of one thing to bring to mind something else. A photograph can serve as an *equivalent* that triggers memory and elicits certain feelings and experiences" (Zakia, 2002: p.85-86).

The idea of an *equivalent* is best exemplified in the F042's excerpt, in which, with regard to Van Gogh, the musical note became equivalent to the blue sky, memory and sound resonated. In a second example, which shows a very clear understanding of the concept of balance/imbalance, F371 described a technique used in painting through analogy with a technique used in writing.

> "The technique used in the background of the painting 'Madam Cézanne in a Yellow Chair' reminds me of the style of an author I studied when I took [a course in] Chinese composition. Her name is Tien-Hsin Chu and she prefers to use some *peculiar wording* which makes it difficult for the readers to read through the article smoothly because of a lack of coherence. However, placing these unusual words in certain paragraphs will also motivate the readers to read the paragraphs many times. The same technique now can be seen in the painting that encourages us to revisit the theme of the work" (F371, Week 14).

In this case, F371 referred to a session in which the teacher carried out a detailed analysis of the Cézanne's painting 'Madame Cézanne in a yellow chair'. In this painting, the dark band in the background is somewhat asymmetrical, that is, the left section is wider and a bit higher that the right (see figure 6.5). This introduces a sense of imbalance, which leaves the eye uncertain and hovering between the two sides. This visual experience has its physiological counterpart in the nervous system, that is, a sense of disequilibrium, which will tend to make the whole configuration fluid (Arnheim, 1974: p.17). In a word, this sense of disequilibrium is likely to be projected onto the main figure *Madame Cézanne*, and in turn creates an effect of potential activity — a sign of life[12]. Similarly, in F371's example, through inserting peculiar words in certain paragraphs, forcing the readers to read these paragraphs repeatedly, a deeper understanding can be achieved. In this case, the appreciation of painting is to a certain extent 'equivalent' to that of writing.

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12 Readers are referred to Section 2.7 for a detailed analysis of the said painting.



Figure 6.5

6.3.4 Summary

The teacher incorporated Gestalt theory as the main part of the curriculum to overcome the problem of evaluating photographs mostly by subjective judgment. During the learning process, the diarists at times had difficulty either understanding the theory or applying the theory to analyze their own photographs. They nonetheless were able to grasp the taught concepts and describe their experiences with confidence. The overall objectives of the course were that not only could the learners apply Gestalt concepts flexibly to analyze images, they could also utilize these concepts to produce satisfactory photographs. As for the application of Gestalt theory in relation to the productive aspect, this is discussed in detail in the following section.

6.4 Application of theory

An acute sense of observation is a prerequisite for photographers to find appropriate subjects. A few students (2/21) perceived it as a natural talent, which would enable them to seize perfect opportunities for combining photographs with theories. But for many learners (7/21), the integration of Gestalt theory and their work was quite difficult and to a certain extent impractical. These themes are discussed in detail in the subsequent sections on *acute sense of observation* and *reflection on applying theory*.

6.4.1 Acute sense of observation (8/21)

The diarists' understanding of powers of observation can be divided into two hierarchical levels. The first is that a lack of this ability would leave them uncertain about what to photograph (7/21). Two typical examples are as follows:

> "It was very important to have *an acute sense of observation*. Most of my classmates (including me) found it difficult to find the subject matter. I really admired the teacher's talent to be able to discover subjects quite easily" (M616, Week 15).

> "After this photography session, I feel that I need to improve my *powers of observation*. I did not take as many pictures as I had for previous assignments [because she could not find proper subjects] and therefore there are only a few acceptable photographs" (F371, Week 15).

A higher level of the understanding of a good sense of observation is that this ability would help the photographers integrate theories more readily into their work. This is best exemplified by F115's comment.

> "I really appreciate the teacher's compliment to my [good] intuition. In fact, the photo that portrays the 4 peasants [figure 6.7] is the first picture I took after arriving at the farm! *At first sight*, I found the 'composition' of the scene very beautiful, and also very similar to that of the photo of 3 ducks [figure 6.6] — *the same composition in different photos*, so I took the picture without hesitation. This photo best proves my improvement after taking this course. Before this course, I would simply overlook such perfect composition like any other tourist would do" (F115, Week 10).

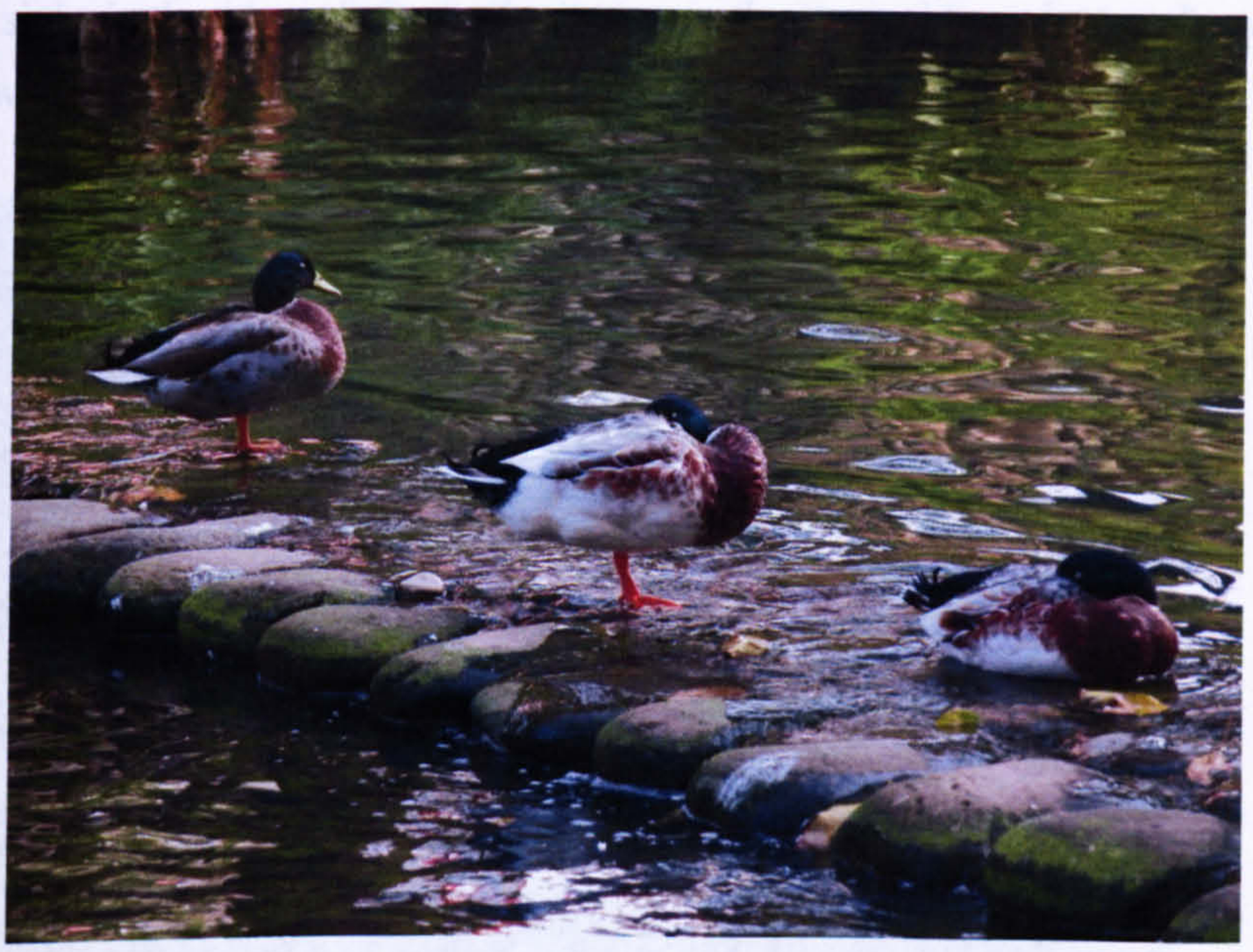


Figure 6.6

The photograph of 3 ducks is an outstanding example which best illustrates a flexible use of the Gestalt principle of similarity.

> "These 3 ducks can be easily grouped together because they are the same species and have similar colors. Although they are ducks of the same kind and [their bodies] are facing the same direction, there are subtle differences, namely the fact that each duck adopts a different body posture, which can be noticed after taking a close look" (accompanying essay of figure 6.6).

What makes this picture interesting and exceptional is the interplay of *dissimilarity in similarity* and *similarity in dissimilarity*. As constant repetition is frequently boring, an anomaly, such as the 3rd duck, can make the image more dynamic. In this case and also in general terms, 'breaking the rules' can be seen as the same as 'applying the principles', in that the former is a variant of the latter.

As regards F115's photograph (see figure 6.7), her acute sense of observation facilitated her grouping of these two separate events (the scene and her memory of the 3-duck photograph) which enabled her to use a similar visual design. The four peasants with similar clothes and hats are easily grouped together, but it is the standing peasant, namely an anomaly, who makes this image more dynamic and interesting. In addition, the farmers' bamboo hats in the foreground find an echo in the

tourists' umbrellas in the background. In this example, what F115 actually grasped at first sight is the idea of *dissimilarity in similarity*, and her picture shows how sensitive she was to her surroundings.



Figure 6.7 **– F115**

6.4.2 Reflection on applying theory (10/21)

One of the major concerns in this diary study is to probe into the learners' personal experiences of image composition, that is, to examine specifically whether they had thought over and utilized Gestalt concepts when composing photographs. Although the processes which the learners chose to write about were potentially a small group of the entire range of their image composing processes (Bailey, 1991: p.80), they were nevertheless helpful in addressing the said question.

For many learners who had tried to apply Gestalt theory to compose photographs, they found it very difficult to produce the desired effect (7/21). For example,

> "I then spent some time practising the concept of continuity [? should be closure]. I found that it is not so easy to present this concept in a picture, especially the concept of critical distance. When I failed to capture the *critical distance*, it was impossible to express my intention and therefore the photograph became less powerful" (M332, Week 6).

> "As to the application of the decisive moment or critical distance [law of closure], I think these [concepts] help us to produce vivid, story-telling photographs. I tried to take pictures of children playing [using the said concepts]; however, it was really difficult to replicate the perfect composition in my mind" (M402, Week 5).

Reading between the lines, it is fairly clear that there was a *gap* between theory and practice. It may be that the diarists' knowledge of the learned theories was only at a superficial level, or they needed a little more practice to close that gap. In the future, the teacher may need to conduct follow-up interviews after each diary inspection so as to gain a thorough understanding of the problem of mismatch, and provide useful feedback which would guide learners through the actions necessary to address that problem.

A number of students (5/21) further held that using Gestalt theory directly or exclusively to compose photographs would be impractical and even restrict their intuitions. On reflection, M509 wrote:

> "More often than not, a predetermined approach to photography, such as in today's case when I tried to use Gestalt theory [exclusively] to produce photographs, was likely to *restrict my intuition*. Therefore, I think we must trust our intuitions and our perceptions of beauty at first sight" (M509, Week 18).

He perceived the Gestalt approach as "*rational training*, which would be helpful in guiding us to [a better understanding] of aesthetics" (Week 18). Instead of adhering to the principles, he thought we needed to follow our intuitions about composing photographs. However, the researcher could ask whether the intuitive sense of grasping the structure of a visual pattern (a gestalt) can be improved by rigorous, 'rational training'. Arnheim believes that there is no reason to suggest that a gestalt shows up with automatic spontaneity, and the graspability of visual patterns depends on the cultural background and the amount of training of the observer. Within limits, he argues, training will refine the categories accessible to an individual (1997: p.29-31). In view of this, the teacher placed considerable emphasis on theoretical training, through which he was seeking to improve the learners' intuitive ability. However, negative views on the utilization of Gestalt theory in the image composing process were not at all uncommon. One student, for example, wrote:

> "How do we use this [the concept of grouping] in composition? At the time we see a beautiful scene — how can we compose visual elements quickly and capture the fleeting view? *It is impossible to think of theories first and then take a picture*. Thus, it has always been a question about how to train oneself to capture the image instinctively in a similar way as our eyes intuitively capture the beautiful scene" (M005, Week 5).

M509 thought that thinking-before-taking was fairly impractical, because it would take time and we might lose the best shutter chance. But he seemed to agree with the teacher that our ability to grasp a gestalt took time to perfect, that training and practice could make a difference. Another student seemed to emphasize the inapplicability of Gestalt theory in the image composing process. Her comment was:

> "Because I did not know much about photography in the past, I was almost carefree when taking pictures. But after taking this course, I became afraid of taking pictures because I was not familiar with those theories. Whenever I took photographs, it [the sense of fear] always made me feel not up to par. It was even more frightening when I had to analyze my own photographs. Not long afterwards, I adopted *a compromise* which was not to think of those theories at first [just took pictures], and afterwards use them to analyze my photographs" (F018, Week 16).

Judging from her words, the need to apply Gestalt principles to her work made her feel constrained. She later recognized that it might be better not to use these principles to produce photographs; instead, they were used to analyze pictures. In other words, her intuitive sense played a crucial role in the creation process, while Gestalt theory was left to the interpretation process. A similar opinion was also expressed by M402 and M632. For example, M632 once wrote: "I have become gradually aware of the importance of intuition, and as a result I think intellectual, logical thinking should not interfere in the practice of composition" (Week 17).

In general, findings in this section reveal that when the learners tried to apply Gestalt theory in practice, they faced two major difficulties. The first was that there was a gap between theory and practice. Having theoretical knowledge did not necessarily mean that the students could apply it accurately to produce desirable photographs. This phenomenon *echoed the results of the portfolio assessment* (Chapter 5), in that learning outcomes of the Theory Analysis dimension were consistently better than those of the Theory Application dimension (see table 5.9). One possible explanation is

that there was no direct link between the in-class theoretical training and the outdoor photography session; the former focused almost exclusively on image analysis using Gestalt theory, while the latter put great emphasis on technical training. Having more frequent in-class workshops or modelling the process of utilizing theory in composition may well be solutions to this problem (see e.g. 6.1.1).

The second difficulty of the application of theory related to the apparent conflict between intuitive thinking and intellectual thinking. A number of students (5/21) seemed to draw a line between the two kinds of perceptual functioning, believing that *intellectual composition*[13] would hinder *intuitive composition*. Arnheim calls these two ways of visual structuring the *intuitive mode* and the *intellectual mode*. In the intuitive mode, the process of structuring, in which visual elements blend into an indivisible but organized whole, occurs to a certain extent below the level of consciousness. What the viewer sees in a picture is already the outcome of that organizational process (1980: p.494-495).

Although intuitive perception conveys the experience of a structure, it does not offer an 'intellectual' analysis of that structure. For this purpose each element in the picture has to be defined separately. Its size, shape and color are determined in isolation, after that the various relations between the elements are explored in a linear sequence. Arnheim argues that in the intellectual mode of cognition, an observer isolates elements and relations among elements from the perceptual field in order to obtain a self-contained description of each component, at the expense of the full context of the image as a whole. The observer then seeks to combine the information acquired and thereby to reconstruct the whole. This is a scientific method, which *contents itself with an approximation of the true phenomenon but gains analytical precision* (1980: p.495; 1997: p.234). The same approach, namely the above process of intellectual analysis, was adopted as a template for the course 'Image Aesthetics' to help the learners appreciate and produce a composition effectively.

But are these students (5/21) right about image composition? Their shared view, in which the creation of a photograph was thought to be an intuitive process and intellectual thinking should not *interfere* in the practice of composition, remains open to discussion. Arnheim also mentions that artists speak disapprovingly when they notice that someone has used 'intellectual' procedures, such as geometrical constructions, imitations and formulas, for his or her composition (1997: p.235).

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13 For lack of a precise term, in this research context, the phrase 'intellectual composition' is used to stand for composing a photograph intellectually, drawing on Gestalt principles.

However, he argues that there is no necessary conflict between intuitive and intellectual cognition, instead, in the arts and in the sciences, productive thinking is characterized by the interplay between the two kinds of mental functioning (1980: p.497).

In conclusion, with regard to the causes of the above-mentioned difficulties, the teacher-researcher perceives that either the learners were not familiar with Gestalt theory, or there were not enough hands-on sessions and teacher-demonstrations. The author cannot resist including here a quotation found in the book "Perception and Imaging", written by the Gestalt psychologist, photography teacher and emeritus professor, Richard D. Zakia. At the end of a section describing Gestalt laws as a means of producing an effective composition, he says:

"It is not sufficient merely to know about something. One must be able to apply that knowledge skillfully. A good picture is a result of knowledge and ability — of knowing and doing. Both can be achieved with rigorous discipline and practice" (Zakia, 2002: p.61).

6.4.3 Summary

An acute sense of observation, in the students' words, was the key to integrating theories into their work. As regards the difficulties in the integration process, either the difficulty of applying theories in practice or the impracticability of *intellectual composition*, the researcher holds an optimistic view in which he believes these problems can be overcome by continual practice and rigorous discipline. In addition, instead of being a stumbling block to the image composing process, intellectual thinking should be perceived as a stepping stone towards an effective composition.

6.5 Artistic perspective

Taking photographs without clear intent was a problem common to many novice photographers. Intention, in the students' words, could mean either the desire to show certain effects in their photographs or the determination to devote more effort to the pursuit of beauty. Pursuit of beauty is a characteristic that photography has in common with numerous art forms. A few participants (3/21) attempted to apply Gestalt theory to the appreciation of painting and music, or questioned the appropriateness of doing so. These issues are further discussed in the following sections on *having an intention* and *art appreciation.*

6.5.1 Having an intention

It may be that because of the time constraints on submitting assignments or the lack of basic photographic knowledge, a number of diarists (5/21) experienced the problem of having no clear intention when taking photographs. These are some of the examples:

> "I had a blind spot while taking pictures, that is, I often did not know what I wanted to express in the photographs. Although the art of producing photographs is perhaps not that serious, a demand for expressing something [in a picture] is essential. This demand could be *the pursuit of beauty* or something that moves the photographer" (F018, Week 5).

> "Since the beginning, I have found it most difficult to get over the problem of having a clear intention when taking pictures. [I think] you must somehow be inspired before you can compose a photograph" (F533, Week 7).

> "[Not having an] intention is always one of my major problems in taking photos. Although the teacher mentioned many times that we could try to take pictures from different angles or using different techniques, I often ran out of ideas of how to do it and so no clear intention could be found [in my photographs]" (F042, Week 14).

It is fairly obvious that during the initial and intermediate phases of learning photography, not knowing what to express in a photograph was a problem common to some of the diarists (5/21). Judging from the first and second assignments (portfolios), this figure, 5 out of 21, is probably an underestimate. Nevertheless, things were gradually becoming better as the course proceeded to the final phase, for example,

F042 at a later date wrote: "This time [3rd photography session] I felt certain what I wanted to express before releasing the shutter, although I did not make it. Ha!" (Week 15). On the other hand, F018 believed that the pursuit of beauty was something a photographer should always bear in mind, which helped her "think more carefully before releasing the shutter, and not to produce only some [meaningless] bits and pieces in a photograph" (Week 5). Another diarist, F533, held a very similar view:

> "When I look back, I realize that I lack the determination to produce a satisfactory photograph. One classmate went to the same underground station several times only to take pictures of a road sign near the exit; another took pictures of a flattened coke can repeatedly in the same road. Personally, I am impressed by their determination and persistence. As the teacher mentioned earlier, he once waited for hours for just one shot. [So] I think what I lack is the determination to the pursuit of beauty" (F533, Week 9).

She hoped to emulate her classmates' and the teacher's determination to devote more effort to pursue a better shot. The researcher perceives this kind of determination as a stronger sense of intention, that is, a great desire to produce better work. Not surprisingly, many learners (6/21) held a similar opinion that continual practice could 'activate' or fulfil their intentions. There are two clear examples.

> "I still believe that at least I was inspired and made an attempt to *activate* my intention to take photographs. As long as I practise more, I shall improve" (F533, Week 7).

> "Continual, substantial practice will result in *the creation of good work*" (F018, Week 15).

Both F533 and F018 believed that practice made perfect. Continual practice is the key to mastering photographic techniques, which is a prerequisite for expressing one's intention in a photograph.

6.5.2 Art appreciation

The Gestalt laws might better be thought of as guiding principles, attempting to describe in a simple way how we segregate and group visual information. Theoretically, they are not only applicable to photography but also to all kinds of visual art forms. In fact, around one fifth of the course was devoted to the analysis of

paintings using Gestalt principles. A few diarists (3/21) attempted to extend the application of Gestalt theory to the appreciation of painting and music. For example,

> "Perhaps we need a long period of time to develop the ability to appreciate these works of art [she was talking about the paintings in the National Gallery in London], but novices like us could also use things we learned in today's class such as the concepts of 'direction [of visual forces]', 'counteraction', 'balance', and 'contrast' [these were the concepts the teacher used to analyze Cézanne's painting 'Madame Cézanne in a yellow chair'] to appreciate the beauty of the artworks. I feel this is the most rewarding part of this course" (F018, Week 14).

In general terms, F018 was writing about the concept of visual balance, which was at the core of the analysis of the said painting. Arnheim uses this concept to explain how a striking effect, namely a subtle blend of serenity and vigor, of firmness and disembodied freedom, is achieved in Cézanne's portrait of his wife (Arnheim, 1974: p.37-41). F018 perceived that these learned notions were also applicable to various types of painting. However, M616 questioned whether the concept of balance could be utilized to make sense of the goal of music making.

> "*Is a work of art truly a pursuit of balance and contrast?* Although my understanding of paintings is rather limited, I am aware of the changes in music in the course of history. For example, music in the Middle Ages was characterized by its religious nature, and the ultimate pursuit of the music was indeed a sense of harmony. However, the development of music after 19th century tends to be disharmonious and asymmetrical. Further, peculiar rhythms and creepy chords have been deliberately created by some modern musicians" (M616, Week 14).

Although there seemed to be some misunderstanding about the meaning of balance and contrast, M616 nevertheless raised an interesting issue. In fact, in addition to music, a tendency towards disharmony and imbalance is not at all uncommon in photography or painting (e.g. the works of Salvador Dalí). Balance in a Gestalt sense is not an end in itself, but a means to an end, that is, a means of improving the effectiveness of pictures (Zakia, 2002: p.61). If imbalance or tension is exactly the effect the artist intends, an imbalanced composition will be perfectly acceptable (see figure 6.8).



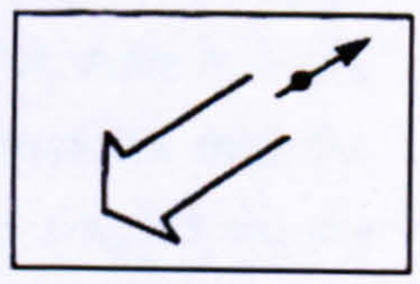


Figure 6.8 **– Michael Freeman**

In the photograph of the worker in the rice field, the imbalanced composition encourages the eye to seek its own equilibrium by paying more attention to the 'empty' area of the frame. That is, the eye and brain want to find something to balance the figure in the top right corner, and therefore keep coming back to the lower left area (see diagram on the bottom right of figure 6.8). This is a deliberate attempt to strengthen the relationship between the subject, the worker, and the surroundings, the rice field (Freeman, 1988: p.26-27).

6.5.3 Summary

Not having a clear intention was a recurrent problem noted in the diaries, and continual practice, in the students' words, seemed to be a practical solution to this problem. With respect to the application of Gestalt theory to non-photography fields, individuals did feel confident enough to express their personal views, such as the excerpts of F018 and M616. It seems inevitable to the researcher that there were learners for whom this particular area of psychology did not work, and it is not necessary or sensible to claim universal benefit for Gestalt theory.

6.6 Results and discussions of the validation session

As described in 4.5.2.3, the researcher conducted a validation session for the diarists to review this analysis report and comment on its accuracy. At the time 12 out of the 21 students attended the session. During the process, the researcher first explained to the participants the purpose and the subject matter of the meeting. Afterwards, he gave each student an analysis report to read through and then asked them to fill out a validation form (see Appendix F). In the form, there were a total of 6 questions: the first 5 questions asked about the accuracy of the analysis account relating to each of the 5 major themes (6.1 – 6.5), and the final one asked about the credibility of the report as a whole. The results of the validation session are shown in table 6.4 and discussed in the order they occurred in the table. Readers are reminded that the comments that in some way questioned the accuracy of the report are singled out for discussion[14] because these comments help the researcher refine his ideas and interpretations. Moreover, the discussion will be more descriptive than analytical because there are not enough responses (only 14 in total for the 5 major themes), and they are of various types.

Result / Theme	Agree	Agree with exception(s)	Disagree
6.1 General response to the course	**66.7% (8)**	**33.3% (4)**	**0.0% (0)**
6.2 Photographic technique	**100.0% (12)**	**0.0% (0)**	**0.0% (0)**
6.3 Image appreciation	**75.0% (9)**	**25.0% (3)**	**0.0% (0)**
6.4 Application of theory	**58.3% (7)**	**41.7% (5)**	**0.0% (0)**
6.5 Artistic perspective	**83.3% (10)**	**16.7% (2)**	**0.0% (0)**
Analysis report as a whole	**91.7% (11)**	**8.3% (1)**	**0.0% (0)**

Table 6.4 The results of the validation session. (...): frequency.

[14] In the validation form, if the "Agree with exception(s)" or "Disagree" box is ticked, the participants are requested to explain why and provide actual example(s).

- **General response to the course (6.1)**

A total of 4 respondents commented on this part of the analysis. Two of them gave reasons why the diarists neglected the issue of extracurricular consultation (6.1.1); one made a statement about the advantage of the photography sessions, i.e. correcting wrong concepts, based on speculation, and one said how he felt about the course without providing any evidence. The latter two cases are excluded from this discussion, as they were not grounded in examples.

In section 6.1, the researcher made an inference about why the students tended to overlook the importance of the extracurricular consultation. The comment in the initial data analysis was:

> "Regarding the reason why the students tended to ignore this issue, the researcher can only speculate that perhaps *the extracurricular consultation* was not held in class hours, and therefore not all the students were able to attend" (6.1.1)[15].

With regard to the researcher's speculation, F115 expressed a somewhat different view:

> "I think the main reason why the students would neglect this issue was possibly because a diary entry was to be recorded on the same day when we were having a class. So they tended to overlook the 'extracurricular' consultation" (F115).

Her idea was reinforced by that of M332.

> "The major reason why things about consultation were rarely noted down was that [the diarists] misunderstood the way of writing a learning diary, for they thought that entries were to be made shortly after the class" (M332).

To prevent this misunderstanding, it may be better to change the title 'learning diary' to 'weekly learning record'. In the Chinese sense, the phrase 'learning diary' carries the implication of *writing what you have learned today*, while 'weekly record' is more usually associated with things that happen in a week.

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15 Hereafter, all the comments or excerpts from the initial analysis are presented in smaller print.

- **Photographic technique (6.2)**

Except for reiterating the teacher's interpretations, the participants made no further comments in this category.

- **Image appreciation (6.3)**

This part of the analysis elicited a total of 3 responses from the participants. Two of them attempted to explain why certain students experienced difficulty in expressing themselves or analyzing photographs. One made a wild guess about why the students of humanities background had difficulty in learning Gestalt theory. The latter is excluded from this discussion.

When discussing the problem of 'listing' or 'reiteration', the researcher believed certain students may prefer to 'flow into a mould' instead of offering their own opinion (6.3.3). The cited example was:

> "The most impressive part of this week's lessons is [the concept of] motion parallax. The teacher explained the concept with a well-known Chinese poem, which made it very easy [to understand]. In addition, the teacher also introduced colour theories and the concept of visual weight" (M048, Week 14).

With reference to the teacher's explanation, F042 gave an alternative interpretation. She wrote:

> "The researcher may be right about this issue — the writers were unwilling to reveal their own views. It may also be that they lacked certain *powers of expression* so they were unable to express themselves clearly. It is possible that the learner [M048] had gained a clear understanding, 'but failed to convey oneself' ".

As for the difficulty in analyzing photographs, the researcher thought that the problem might relate to a lack of sufficient writing skills or a clear understanding of certain theories (6.3.2). The quoted excerpt was:

> "After the first photography session, I have become more familiar with the applications of aperture and shutter. However, while I was doing the coursework about the analysis of my photographs, I still found it difficult to describe precisely my feelings towards certain pictures"

(F371, Week 4).

F233 offered a somewhat different interpretation in relation to the researcher's. Her comment was:

> "As for what F371 or F937 said about the difficulty in describing photos, it may not be that they had difficulty in understanding certain theories. Instead, [I thought] the problem was that they did not possess sufficient *powers of expression*".

Her comment echoed exactly the remark made by F042. In their words, it seems that not having sufficient powers of expression was a recurrent problem of diary writing. In future, a clear explanation of the purpose of the learning record will be an essential preliminary, and it is possible to use excerpts from previous groups to illustrate what can be done.

- **Application of theory (6.4)**

Five respondents made comments on this part of the analysis. Three of them gave reasons or made inferences about the application of Gestalt theory in the image composing process. The other two expressed their personal views but failed to provide any supporting information, and therefore their responses are discarded in the subsequent discussions.

Concerning the discussion of the utilization of Gestalt theory in the process of composition, the researcher's comment on M005's view received contradictory responses from M616 and M005. The target text in the original analysis was:

> "How do we use this [the concept of grouping] in composition? At the time we see a beautiful scene — how can we compose visual elements quickly and capture the fleeting view? *It is impossible to think of theories first and then take a picture.* Thus, it has always been a question about how to train oneself to capture the image instinctively in a similar way as our eyes intuitively capture the beautiful scene" (M005, Week 5).

M509 thought that thinking-before-taking was fairly impractical, because it would take time and we might lose the best shutter chance. But he seemed to agree with the teacher that our ability to grasp a gestalt took time to perfect, that training and practice could make a difference.

With regard to the researcher's comment, M616 held a very different view. His excerpt reads:

> "I thought the ability of composing is a natural talent plus a matter of luck, and it is not possible to acquire it through training".

On the contrary, M005, in a response to his own words, emphasized again that training and practice could make a difference. He wrote:

> "When I said 'impossible', I did not mean that using theory was not possible. Instead, it would be difficult to use Gestalt theory to compose photographs before having a clear understanding of the theory. We should practise hard and make Gestalt theory part of our nature so we can use it with ease".

In a discussion of the *intellectual composition*, the researcher made a comment on an excerpt from the diary of F018 (6.4.2). She was describing her difficulty in applying Gestalt principles. The excerpt and the researcher's comment were:

> "Because I did not know much about photography in the past, I was almost carefree when taking pictures. But after taking this course, I became afraid of taking pictures because I was not familiar with those theories. Whenever I took photographs, it [the sense of fear] always made me feel not up to par. It was even more frightening when I had to analyze my own photographs. Not long afterwards, I adopted *a compromise* which was not to think of those theories at first [just took pictures], and afterwards use them to analyze my photographs" (F018, Week 16).

Judging from her words, the need to apply Gestalt principles to her work made her feel constrained. She later recognized that it might be better not to use these principles to produce photographs; instead, they were used to analyze pictures. In other words, her intuitive sense played a crucial role in the creation process, while Gestalt theory was left to the interpretation process.

An alternative interpretation of the quoted excerpt was given by F042, in that she wrote:

> "Excluding intellectual thinking from the composing process did not mean that she [F018] failed to apply theory [to her work]. As M005 speculated on this issue (see the previous page), *theory might become part of our intuition through training*. So in F018's case, she may have already integrated theory [unconsciously] into her work".

Although F042 seemed to agree that once again training could make a difference, she nevertheless pointed out the researcher's blind spot. Considering M509, M632, M005 and F018's shared view (see 6.4.2), that intellectual thinking should not interfere in the practice of composition, the researcher perceived that these learners failed to integrate Gestalt theory into their work. However, F042 made it clear that excluding intellectual thinking from the composing process did mot mean they were unable to apply theory; they might have achieved the desired results below the level of consciousness. It is still an open question as to whether training can improve intuition, but this does suggest areas for further studies.

- **Artistic perspective (6.5)**

There were only 2 respondents who commented on this part of analysis. One added weight to the researcher's view on the benefits of continual practice (6.5.1); the other repeated what he said in sub-section "Art appreciation" (M616, 6.5.2). Readers are referred to that section for more information.

When discussing the problem of taking pictures without clear intent (6.5.1), the researcher limited his analysis to the benefits of practice. He thought that constant practice could help the learners 'activate' or fulfill their intentions. The comment and its related quotations were:

> "I still believe that at least I was inspired and made an attempt to *activate* my intention to take photographs. As long as I practise more, I shall improve" (F533, Week 7).

> "Continual, substantial practice will result in *the creation of good work*" (F018, Week 15).

Both F533 and F018 believed that practice made perfect. Continual practice is the key to mastering photographic techniques, which is a prerequisite for expressing one's intention in a photograph.

In addition to the teacher's explanation, F042 thought that mastering photographic skills might not be the only benefit of continual practice. Her comment was:

> "We need to practise repeatedly in order to catch our train of thought, seize the intention, and express our own views. This is also one of the benefits of practice".

- The analysis report as a whole

In general, the participants recognized the analysis report as a whole as a credible account of their learning experiences (see table 6.4). Only one student complained about the typesetting of the report, which was too compact for comfortable reading. A typical example of the positive responses reads:

> "[The researcher] did not distort the students' ideas. He adopted an objective view in most cases, analyzing [our diaries] in a cautious way" (M332).

In conclusion, obtaining responses from the diarists to the analysis account was time-consuming, but the respondents have helped the researcher:

- verify that he has reflected their perspectives;
- acquire new ideas and alternative interpretations;
- establish the meaningfulness of the findings and interpretations, and therefore add credibility to his work (Lincoln & Guba, 1999: p.419; Patton, 2002: p.560).

6.7 Summary

The purpose of the diary study was to investigate the participants' learning experiences on the course and specifically about Gestalt theory. In general, the diaries show that the course had an overall positive effect on their learning, with the exceptions that there were some reservations expressed about the utilization of Gestalt theory in the image composing process and the appreciation of music. Findings in this chapter enabled the researcher not only to address the main research question, but also to answer the second and third subsidiary research questions (see below).

- What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory?

- Have students' learning experiences of Gestalt theory influenced their image composing processes?

With regard to the last research question, the diarists' responses were found somewhat contradictory yet realistic. It is not to be denied that although Gestalt training had had a profound impact on the learners' image composition, this influence was not

necessarily positive. Furthermore, the perceived conflict between intuitive composition and intellectual composition remains open to further studies.

Chapter 7 Conclusions and Recommendations

The general aim of the thesis was to justify the claim that image analysis based on Gestalt theory can be an alternative and valuable approach to teaching photography. In this final chapter, the presentation will start with an overview of the thesis, showing that the research evidence presented in the study was supportive of the main and subsidiary arguments. This is followed by a section that suggests avenues for potential future research. Finally, some closing remarks are given.

7.1 An overview of the thesis

In Chapter 1 the motivation for the arguments, purpose of the study, significance of the research, and organization of the thesis were presented. In a general sense, it described the current trends and major problems of photographic education in Taiwan. Within this broader context, photography has most often been perceived as a form of technical training, lacking basic academic orientation or status (Wu, 1985). More specifically, the teacher-researcher integrated Gestalt theory into his photography curriculum, aiming to examine whether this integration can help students move up a step on the appreciation and production ladder of photography. It is on these premises that a main research question and three subsidiary questions were posed. The research questions are as follows:

Does the use of image analysis based on Gestalt theory help students improve their understanding and practice in photography?

Subsidiary questions:

- Is image analysis effective in developing students' ability to appreciate and produce photographs?

- What thoughts and feelings do students have about their individual learning experiences on the course and specifically about Gestalt theory?

- Have students' learning experience of Gestalt theory influenced their image composing processes?

The second chapter provided a review of the literature on Gestalt theory, drawing heavily on Rudolf Arnheim's theoretical framework (1974, 1997). Discussions were focused on the ways we respond to visual images, assuming the existence of common visual languages or visual grammar (Wu, 1993). Implications were then drawn from those views for a theoretical discussion linking Gestalt theory to art and photography. A critique of the strengths and limitations of Arnheim's expanded Gestalt theory was also provided.

The third chapter provided some selective reviews of the development of assessment. The key concept was that of formative assessment. Although it was time consuming and required more effort from the teacher, it was thought to be an essential component of the learning process. Only sketches of issues about assessment in photography had been made, focusing mostly on the practicality of performance criteria and their relevance to teaching and learning. The chapter finished with a brief review of a few assessment instruments, that is, scoring rubrics and a scoring sheet. The most practical part of the presentation in this chapter lay in discussing the five practical steps for developing a sound assessment, emphasizing the formative role in the process.

At the beginning of *the fourth chapter*, it was shown that the characteristics of the research meshed nicely with those of action research. The chapter then elaborated the methods used to collect, analyze and interpret two main types of data, namely the student portfolios and learning diaries. An Effect Size measure was used for evaluating the portfolios, as it was a more accurate and appropriate approach to reporting and interpreting the effectiveness of the teacher's intervention. The results were assessed from the teacher's perspective. Thematic Analysis was adopted to analyze the learning diaries, which express opinions from the students' perspectives. The collection of the data from different perspectives was carefully planned and conducted, serving a triangulation purpose.

The data from the pilot study were presented in this chapter, with suggestions for a number of revisions to the teaching programme and research design. Discussions of the reliability and validity issues were given, such as the inter-rater reliability test for the portfolio assessment and the validation session for the diary analysis, and the results showed that the assessment of the students' performance and experience were both reliable and valid. These issues were further discussed in Chapter 5 and Chapter 6 respectively. This chapter finished with a discussion of the limitations of the

research design, which carried practical implications for future studies.

The fifth chapter started with a discussion of the inter-rater reliability issues, as it was a prerequisite for the course evaluation in terms of its validity. It was shown that the two independent assessors generally agreed on the level of proficiency demonstrated, with close agreements at 93.7% and 85.7% respectively, which provided evidence that the assessment results reflected student proficiency and therefore progress. The presentation then turned to the positive effects of learning photography – with a mean Effect Size of 1.80, the limitations of interpreting these effects, and the discrepancies in the effects among the three assessment dimensions and between the two assessors. Analysis of the portfolio assessment results had not only provided concrete evidence to answer the main and the first subsidiary research questions, but also had practical implications for effective photography teaching in the near future. In short, *from the teacher's perspective*, the students had made substantial progress in the productive aspect as well as the appreciative aspect of photography, which justified his intervention in terms of its effectiveness.

The purpose of *the sixth chapter* was to investigate the participants' learning experiences on the course and specifically about Gestalt theory. A detailed analysis of the 21 participants' diaries was performed using Thematic Analysis (Boyatzis, 1998), through which a total of 5 major themes and 14 subsidiary themes were identified. In general, *from the students' perspectives*, the diaries showed that the course had an overall positive effect on their learning, with the exceptions that there were some reservations expressed about the utilization of Gestalt theory in the image composing process and the appreciation of music.

A validation session was conducted for the participants to review the diary analysis and comment on its accuracy. The results showed that the participants generally perceived the analysis report as a whole as a credible account of their learning experiences. In turn, their comments and responses were incorporated into the final part of this chapter. Although obtaining responses from the diarists to the analysis account was time- and labour-consuming, the respondents had helped the researcher verify that he had reflected their perspectives, acquired new ideas and alternative interpretations, and established the meaningfulness of the findings and interpretations that added credibility to his work (Lincoln & Guba, 1999: p.419; Patton, 2002: p.560).

Findings in this chapter enabled the researcher not only to address the main research question, but also to answer the second and third subsidiary research questions. With regard to the third subsidiary question, i.e. whether Gestalt training had influenced image composition, the diarists' responses were found to be somewhat contradictory yet realistic. It is not to be denied that although Gestalt training had had a profound impact on their image composing processes, this influence was not necessarily positive. Furthermore, the perceived conflict between *intuitive composition* and *intellectual composition* remains open to further studies.

A new cycle of action research

What makes action research different from usual teaching practice is that teachers as researchers have to provide evidence to show how situations have changed because of their influence. In this thesis, Chapter 5 and Chapter 6 have provided concrete evidence that the teacher-researcher's intervention had an overall positive effect on the teaching and learning. Furthermore, as a reflective practitioner (Schön, 1991), the teacher could ask: "How can I improve teaching and learning for *the next cycle of action research*?" (see the second box from the bottom left in figure 4.1).

It has been noted that this question can be addressed in terms of the following aspects.

- The proportion of technical training to theoretical content needs to be increased, which may overcome the problem that student learning outcomes were particularly favourable to the Theory Analysis dimension (see 5.3).

- The number of outdoor photography sessions should be reduced and replaced by more frequent in-class workshops, because it is believed that the latter had a better effect than the former (see 6.1.1).

- In view of the difficulty in analyzing photographs (see 6.3.2), it seems that not having sufficient powers of expression might well have been one of the reasons. Thus it may be beneficial to forward the sample portfolios of higher level of performance, i.e. a score of 3 or 4, to future students, in an attempt to ensure a better understanding of the analytical process.

7.2 Recommendations for further research

This study examined the influence of Gestalt training on learning photography. In analyzing the results a number of questions have arisen, which cannot be easily answered from the data obtained. There are two potential subjects raised by the reported work that are considered worthwhile for further research.

The first relates to the seeming contradiction between intellectual thinking and intuitive thinking. As shown in sections 6.4.2 and 6.6, a number of students seemed to draw a line between the two kinds of perceptual functioning, believing that intellectual composition would hinder intuitive composition. However, excluding intellectual thinking in the practice of composition did not mean the learners failed to integrate theory into their work; instead, they might have achieved the desired results *intuitively*. While the researcher was confident in claiming that intuition could be improved through intellectual training and continual practice, there were nonetheless insufficient grounds to maintain that Gestalt theory had played an important role in the image composing process. However, this does indicate areas for further studies. It would be interesting to find out the extent to which training can improve intuition and how to bridge the gap between theory and practice. The latter is the more practical question to address, and a number of attempts have been made in the discussion in section 6.4.2.

The second of the potential research topic relates to the uneven composition of the student participants. There was undoubted merit in working with a homogeneous group of informants in terms of their educational backgrounds and genders[1]. However, as mentioned in sections 6.1.4 and 6.3.2, female and male students responded differently to the teacher's approval and students of humanities background appeared to experience difficulty in learning Gestalt theory, and these were not fully addressed by the diary analysis. However, the validity of the various points made in this thesis concerning responses to the curriculum and Gestalt theory would be strengthened through comparison with the responses of subgroups in the same learning environment from a more appropriate participant composition, that is, similar proportions of males to females and students of science background to humanities background. Furthermore, a larger sample size will be required for more appropriate statistical references.

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[1] Readers are referred to table 4.9 for detailed information, in that there were only 8 females and 4 humanities students out of the 21 participants.

7.3 Closing remarks

The research results presented in the thesis have shown that Gestalt training has significant educational benefits for the target students, which carries practical implications for the applicability of Gestalt theory to a different educational setting. However, it has been noticed that artists or art educators may disapprove of intellectual training, but its potential benefits to the improvement of intuition are not to be ignored.

Although great attention has been devoted to intellectual training in this project, the importance of intuition in photographic creation should not be overlooked. Arnheim believes that the idea of making art is intuitive:

"When I do a figure [carve wooden figures], and I decide whether I want in this way or that way, I don't think about principles at all, but somehow they lurk in me and they keep controlling what I do without my permitting them to make any formal statement" (Kleinman & Van Duzer,1997: p.126).

The last sentence gives more than a clue to the role that Gestalt principles have to play in the process of creation. It is important to note that while Gestalt psychologists call these principles 'laws', they are *laws of perception* rather than *laws of creation*. At a conscious level, they do not impose limitations on our behaviour.

We are now in a better position to clarify the distinction between intuition and intellect. Gestalt psychologists recognize that practically all the mental and physical topics we wish to study are field processes. This is true for biology, psychology and the arts, for the social sciences as well as a good deal of natural science. Furthermore, every successful scientific inquiry of a field process begins with an intuitive grasp of the configuration to be accounted for, and the intellectual network of components and relations must endeavor to approach as closely as possible the structure of that configuration (Arnheim, 1986: p.28).

To accommodate the great variety of structures, which ranges from the extreme of total absence of subdivision in the whole to almost total lack of interaction between the parts, the human mind is equipped with two cognitive procedures, intuitive perception and intellectual analysis. Arnheim argues:

"These two abilities are equally valuable and equally indispensable. Neither is unique to particular human activities; they are both common to all of them. Intuition is privileged to perceive the overall structure of configurations. Intellectual analysis serves to abstract the character of entities and events from individual contexts and defines them 'as such'. Intuition and intellect do not operate separately but in almost every case require each other's cooperation. *In education, to neglect the one in favor of the other or to keep them apart cannot but cripple the minds we are trying to nurture*" (ibid, p.35).

This seems to the researcher exactly right.

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Appendix A: The teaching programme for 'Image Aesthetics', September 2005

1. Structure of the curriculum

This section contains the structure and content, i.e. the syllabus, of 'Image Aesthetics'. The course was offered twice in an academic year, once per semester. Each semester in general covered 18 weeks of classes, and each class lasted three hours. The course was divided into 12 connected units; some units take more teaching hours than others. Below is the syllabus for 'Image Aesthetics' for the first semester of the academic year 2005-6, i.e. *the duration of the pilot study*, which started in September 2005 and ended in February 2006.

Unit/Time		**Course content**	
1st unit	1st week	Introduction to the course.	
2nd unit	2nd week	Visual selection: *figure* and *ground*.	
3rd unit	3rd week	1st photography session – 1st data collection date.	
4th unit	4th week	Gestalt Grouping.	
	5th week		
	6th week		
5th unit	7th week	Memory and association.	
6th unit	8th week	Midterm presentation – 2nd data collection date.	
	9th week		
7th unit	10th week	2nd photography session – 3rd data collection date.	
8th unit	11th week	Space, time and color.	
	12th week		
9th unit	13th week	Contours.	Art psychology session – Balance
	14th week		Art psychology session – Balance
10th unit	15th week	3rd photography session: to be held outside the university campus.	
11th unit	16th week	Illusion/Ambiguity.	Art psychology session – Simplicity
	17th week		Art psychology session – Past experience
12th unit	18th week	Final project: an electronic portfolio – final data collection date.	
Textbooks		• Arnheim, R. (1974) Art and Visual Perception. University of California Press. • Gombrich, E. H. (1998) The Story of Art. • Zakia, R. D. (2002) Perception and Imaging, 2nd edition. Focal Press.	

Table A1 A structured syllabus for 'Image Aesthetics'.

2. Teaching

The concept of Gestalt grouping of visual elements is at the core of the curriculum. Units of the course are closely related to each other, forming a coherent whole. Each class consists of two main sections: the teacher's lecture and the students' group discussions, and the ratio of the amount of time on lecture to discussion is approximately four to one. The teacher plays a leading role in the first section of a unit, imparting skills and knowledge to his students by offering a range of rich visual experiences, e.g. using Microsoft PowerPoint slide shows instead of printed materials. The purpose is to provoke reflection and discussion. The second part is the group discussion. The students form groups, usually 3 to 6 students in a group, to discuss course content or questions raised by the teacher. During the discussion, the teacher participates in each group and offers relevant feedback. Before finishing the class, the teacher randomly selects students from several groups (one student from each group) to present their learning outcomes. The foregoing process is revealed in table A2.

Teacher's Lecture (80%)	The teacher plays a leading role in the first section, imparting skills and knowledge to his students by offering a range of rich visual experiences, e.g. using a Microsoft PowerPoint slide show instead of printed materials.	
Group Discussion (20%)	**Discussion**	The students form groups, usually 3 to 6 students in a group, to discuss course content or questions raised by the teacher. During the discussion, the teacher participates in each group and offers appropriate advice.
	Presentation	Before the end of the class, the teacher randomly selects students from several groups (one student from each group) to present their learning outcomes.

Table A2. The structure of a lesson.

2.1 Unit format

- Description of unit:

A brief description of the course content of the unit is given, together with the key areas of study associated with the unit.

- Teaching objectives (expected learning outcomes) and assessment criteria:

Each unit contains the statements of the objectives that each student is expected to achieve against particular criteria (see table A3 for an example).

The relevant information about textbook, materials and coursework is also included in this section (table A3).

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the camera and accessories: camera type, e.g. conventional film camera and digital camera; lens type, e.g. standard, wide angle and telephoto lens; film and memory card.	● use photographic equipments correctly and effectively.
Textbook: Imaging and Perception (Zakia, 1999). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:** Students submit their practical work (photographs) electronically, using Microsoft PowerPoint.	

Table A3.

3. Learning and assessment

As seen in table A3, each course unit contains expected learning outcomes and related criteria for assessment. These criteria are used to measure the effectiveness of student learning. They have to be used cooperatively with the criteria of other units to assess student performances in their coursework, presentations and final portfolios. The

teacher should apply the criteria holistically to judge all the works in, say, student portfolios, rather than focusing on a single photograph or a few photographs exclusively. When assessing student portfolios or coursework, the criteria are to be used as guidelines and reviewed on a regular basis. Therefore, the teacher's own intuitive and experiential understanding of student performance against certain criteria still plays a very important role in the evaluation process.

4. A learning diary

To be able to gain useful insight into students' photography learning experiences, and also to address potential problems in the course, the teacher will invite student volunteers to participate in a diary study. In the diaries, learners make regular comments about their experiences in the classroom. Since keeping a diary can take a lot of time, there will be no rules about what a student should write or how much he or she should write. That will depend on what they are interested in or confused about and how much time they have. However, given my evaluation objectives, I do provide a few guidelines such as "What have I learned in this week?", "Are the visualized teaching materials easy to absorb?", and "Are there enough photography sessions for me?" and so on. These are provided at the bottom of the diary page as hints as to how they might proceed (see table A4 — a sample page). After the mid-term presentation, the students are asked to hand in their diary entries, and the teacher will give each student some feedback on his or her task. At the end of a term, the students submit their diaries. During the course, the teacher also keeps a journal of his reflections on teaching and classroom observation.

The Learning Diary for 'Image Aesthetics' 1st week		
Name:	**Department:**	**Course content:**
Hints: What have I learned in this week? Are the lectures easily understood? Are the visual teaching materials easy to absorb? Is there anything the teacher should add to the curriculum? What have I learned in the photography sessions? Are there enough photography sessions for me? Have I experienced any difficulties with theoretical concepts? How can I apply theoretical concepts to practical work? *These are provided only as guidelines; you are very welcome to provide your own reflections on the course.*		

Table A4. A sample page of the learning diary.

5. Units

Unit 1: Introduction to the Course

- **Description of unit**

  A brief description of the overall purpose of the course is given, together with a detailed exposition of the syllabus and the assessment procedures.

- **Teaching objectives and assessment criteria**

Teaching objectives	Assessment criteria
An introduction to the core concept — Gestalt psychology.	• Not applicable.
A detailed description of the course content, including the structure, photography session, midterm presentation, and final portfolio.	• Not applicable.
Marking	• 30% of the marks are awarded for the coursework, 30% for the presentation, and 40% for the final portfolio.
Textbook: **Material:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 2: Visual selection—*figure* and *ground*

- **Description of unit**

Each image we encounter in our daily lives possesses a pair of distinguishable attributes: figure and ground. This unit delineates the concept of figure-ground relationships carefully by offering a number of graphic examples. The relationship between figure and ground is usually reversible where figure can become ground and ground, figure. It should be borne in mind that the concept is not limited to visual perception. Since all of our senses are tied into the same central nervous system (our brain), it is quite normal that a concept such as figure-ground should be valid for all senses (Zakia, 1999: p.13).

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the concept of figure and ground, using examples from graphic design, psychology, photography, and works of art.	● apply the concept of figure and ground, such as figure-ground enhancement, to analyze or produce images.
Textbook: Chapter 1 of Imaging and Perception (Zakia, 1999). **Material:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 3: The first photography session

- **Description of unit**

This is the first photography session in the semester. It comprises first, in the classroom, a brief introduction to a photographic system and second, a practical photographic outdoor training session. During the first part of the session, the teacher introduces the basic structure of a photographic system — a camera, lens and its accessories, including camera and lens types, image storing media. Afterwards, the class moves to a suitable spot in the university campus. A camera in hand, the teacher demonstrates how to fine-tune aperture and shutter that allows more or less light into the camera. The unit emphasizes using different apertures or shutter speeds to achieve different visual effects, that is, in a photograph, large or small apertures directly affect the depth of field, and high or low shutter speeds are used to freeze motion or to suggest movement. The students should pay careful attention to the reciprocal relationship between aperture and shutter. Although the same exposure value can be obtained through different combinations of aperture and shutter (e.g. large aperture, high shutter speed or small aperture, low shutter speed), the visual effects achieved are to be significantly different in terms of the feeling of depth and movement.

It's requested that each student submits his or her coursework electronically before the next lesson, using Microsoft PowerPoint. The PowerPoint file should comprise at least 20 photographs, and each photograph is to be supported by a self-evaluative essay, consisting of at least 100 words. In the essay, the student is to analyze his or her photographs using Gestalt theory.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the camera and accessories: camera type, e.g. conventional film camera and digital camera; lens type, e.g. standard, wide angle and telephoto lens; film and memory card.	• use photographic equipments correctly and effectively.
An introduction to using apertures and shutter speed to allow more or less light into a camera. The unit emphasizes using different apertures or shutter speeds to achieve different visual effects, that is, in a photograph, large or small apertures directly affect the depth of field, and high or low shutter speeds are used to freeze motion or to suggest movement.	• adjust aperture appropriately to acquire a desired depth of field. • control shutter speed appropriately to capture the moment or to suggest movement.
Textbook: **Materials:** The teacher's handouts; digital cameras and memory cards. **Coursework:** Students submit their practical work (photographs) electronically, using Microsoft PowerPoint.	

Unit 4: Gestalt grouping

- **Description of unit**

  The unit starts with a one-hour seminar for the preceding photography session, aiming at improving student performance along the assessment dimensions, i.e. Photographic Technique, Theory Analysis, and Theory Application. The teacher randomly selects four to six samples from all assignments, and performs a detailed, analytical exposition. During the process, students are free to express and share their opinions on the subject matter.

This unit introduces learners to the 4 basic laws of Gestalt grouping, that is, law of *proximity*, *similarity*, *continuity* and *closure*. It is primarily concerned with the application of these laws to the appreciation and production of photography. The Gestalt psychology provides us with some simple and convincing evidence about how we group and organize visual elements so that they are perceived as wholes. In other words, what you perceive in a photograph is quite different from what you would perceive when you look at each item in the photograph separately. In Gestalt theory, the *whole* is different from the *sum of its parts*. The Gestalt psychologists are especially interested in figure-ground relationships and in the subjects that could help us to see things as good patterns or figures. They suggest a number of principles, but this unit concentrates on only four of them: the laws of proximity, similarity, continuity, and closure (Zakia, 1999:p.30).

This unit places particular emphasis on the extent to which students can apply the Gestalt laws to analyze photographs and paintings, and furthermore to their practical work.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
This unit introduces learners to the 4 basic laws of Gestalt grouping, that is, law of *proximity*, *similarity*, *continuity* and *closure*.	• apply the 4 basic laws of Gestalt grouping to analyse images. • apply the 4 basic laws of Gestalt grouping to produce images.
Textbook: Chapter 2 of Imaging and Perception (Zakia, 1999). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 5: Memory and association

- **Description of unit**

Memory is an integral part of perception. It is much easier to see what we know, what is stored in memory, than to see what we do not know, what is not in memory. This unit focuses on the close relationship between memory and perception, and varied ways of association that deepen and internalize our memories and therefore, our perceptions. It comprises two connected sections:

The first section introduces learners to how different forms of memory affect our perception, including an introduction to short-term/long-term memory, visual memory and color memory.

The second focuses on the *signifiers* or *metaphors* which have associative value that links memory with perception, including advertisements, props, colors, equivalents, synesthesia and onomatopoeia.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the different forms of memory which affect perception, including short-term/long-term memory, visual memory and color memory.	• support analysis of the meaning or effect of an image with the concept of association. • produce work with associative value that links memory with perception.
An introduction to the signifiers or metaphors which have associative value that links memory with perception, including advertisements, props, colors, equivalents, synesthesia and onomatopoeia.	
Textbook: Chapter 3 of Imaging and Perception (Zakia, 1999). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 6: Midterm presentation

- **Description of unit**

The 8th and 9th weeks in a term are presentation weeks, and therefore there are no lectures in this unit. The presentation itself can be seen as an interactive examination, since students have to present their work publicly, and they also have to respond to queries from the teacher and classmates. While giving a presentation, each student has 6 to 8 minutes to present his or her learning outcomes. The chosen topic has to be closely related to the course. However, at this point, students are allowed to have more freedom to choose their tasks. They could perform their tasks beyond the scope of my teaching, e.g. a presentation of impressionist paintings using the concept of Gestalt grouping, but a negotiation with me in advance is necessary. After the presentation, each student is requested to have a short talk with the teacher and submit an electronic file (in Microsoft PowerPoint format) of his or her presentation.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The teacher should:
An introduction to the rules and procedure of the midterm presentation, including a time limit, the queries from the teacher and classmates, and a post-exam talk. Each student is expected to have a short talk with the teacher after his or her presentation.	● apply all the criteria holistically, judging a student's presentation along three dimensions: content, organization, and delivery, and giving an integrated score[1].
Textbook: **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

[1] The reason why the teacher does not assign each dimension a score, and average the individual scores into a single one for the midterm presentation is because of the time constraint (each student 6 to 8 minutes only).

Unit 7: The second photography session

- **Description of unit**

This is an outdoor photography lesson which provides learners with knowledge and understanding of the core concept in a photographic process, i.e. exposure, which is the amount of light that is allowed to enter the camera when taking a photograph. Exposure value is determined by the *diameter* of an aperture and the *duration* of a shutter. This unit introduces students to the notion of *a perfect exposure* in photography. A perfect exposure is one which captures exactly what we wanted to capture, or one which seems to mesh perfectly with the subject matter (Hicks, 1999: p.8). With the help of a digital camera, the teacher can demonstrate the exposure effect on the LCD screen immediately after the exposure was made.

The unit lays great emphasis on how to judge or achieve a good or perfect exposure, contrasting with under-exposure (too dark) or over-exposure (too bright).

An additional introduction to the utilization of white balance and ISO[2] is included, that is, adjusting ISO appropriately to obtain a more favorable aperture or shutter speed, or adjust white balance to obtain a better color reproduction.

It's requested that each student submits his or her coursework electronically before the next lesson, using Microsoft PowerPoint (see Unit 3).

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[2] ISO stands for International Standards Organization, which sets standards for the size, shape, and technical features of industrial goods, electrical products etc. Here, adjusting ISO means to raise or lower the sensitivity to light of the exposure meter in a camera.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
A further introduction to the basic photographic skills, that is, the use of apertures, shutter speed (see Unit 3), white balance, and ISO.	● adjust white balance appropriately to obtain a better color reproduction. ● adjust ISO appropriately to obtain a more favorable aperture or shutter speed.
An introduction to the notion of a **'perfect'** exposure (rather than **correct** exposure), i.e. an ideal combination of aperture and shutter speed.	● judge whether an image is ideally exposed. ● produce ideally exposed images consistently.
Textbook: **Materials:** The teacher's handouts; digital cameras and memory cards. **Coursework:** Students submit their practical work (photographs) electronically, using Microsoft PowerPoint.	

Unit 8: Space, time and color

- **Description of unit**

The unit starts with a one-hour seminar for the preceding photography session (see Unit 4).

The aim of this unit is to introduce learners to a variety of **visual experiences** within our visual field, which can be grouped into three areas: space, time, and color as shown in table **A5**.

Table A5 Three Visual Attributes (Burnham et al., 1963: p.11-12)

Visual Experiences		
Space	**Time**	**Color**
depth (perspective)	movement	hue
Transparency	flicker	saturation (chroma)
Size	sparkle	brightness (value)
shape/form	fluctuation	
texture	glitter	

This unit enables learners to develop their knowledge and skills across a range of photographic genres, that is:

- using perspective to show depth in a picture (**space**);
- stimulating the feeling of movement in a still photograph by using techniques such as a slow shutter speed, slight out of focus, panning a moving object, or multiple exposures(**time**);

- recognizing that color is not only dependent on light, but also on its context or surround, and furthermore, the appearance of color is not only unique to its surround but also to its mode of presentation (**color**).

An additional lecture on some basic, compositional skills of photography, including 'the rule of thirds', 'psychological line' and 'delayed reaction'.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the three main subject areas of our visual experiences – space, time, and color. This unit enables learners to develop their knowledge and skills across a range of photographic genres, that is, using perspective to show depth in a picture, suggesting movement in a still photograph, and recognizing the relativity of color in different contexts.	• support analysis of the feeling of depth in an image with the concept of perspective. • create the feeling of depth in an image through the use of perspective. • use techniques such as a slow shutter speed, slight out of focus, panning a moving object, or multiple exposures to suggest movement in a still image. • make colors more saturated, and thus make the composition of an image more dramatic, by making color complements as part of the visual design and analysis.
Textbook: Chapter 4 of Imaging and Perception (Zakia, 1999). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 9: Balance, Contours

- **Description of unit**

This unit starts to incorporate *art psychology* lessons into normal sessions; these lessons are held over a four-week period, each lesson lasting an hour. The aim of the extra lessons is to introduce the core concepts of the Gestalt psychology of art: *balance* and *simplicity*[3]. These lessons are based on Rudolf Arnheim's book, *Art and Visual Perception*. Working from a Gestalt frame of reference Arnheim argues, as do other Gestalt psychologists, that pictorial balance is basically indispensable. The reasons why the lessons are not separated from normal lessons and form a single unit are firstly, it is quite difficult for novice photographers to understand Arnheim's sophisticated theories within a short period of time, say, 1 to 2 weeks and secondly, the close relationship between the course and certain psychological theories has to be taken into account, for example, *illusion* and *simplicity* (which will be described next unit). Therefore, lecture hours are separated into two sections: first, balance and second, contours.

The first section of the unit starts with the introduction of pictorial balance, including *static balance* and *dynamic balance*. Dynamic balance tends to be more interesting than static one since too static a balance leaves less for the viewer to work at (Freeman, 1988: p.26). Afterwards, the teacher uses the concept of Gestalt field forces to explain explicitly what we mean by balance (equilibrium) in a picture and why this balance is indispensable. Visually as well as physically balance is the state of distribution in which all psychological forces (and the corresponding physiological forces in the nervous system) compensate one another, resulting in the standstill of all "visual action" (Arnheim, 1974: p.20).

"In a balanced composition all such factors as shape, direction, and location are mutually determined in such a way that no change seems possible, and the whole assumes the character of 'necessity' in all its parts" (ibid, p.20).

In other words, under conditions of imbalance, the artistic intent becomes incomprehensible, because the elements of an unbalanced composition show a tendency to change place or shape (visually rather than physically) in order to reach a state that better accords with the total structure — the whole (ibid, p20).

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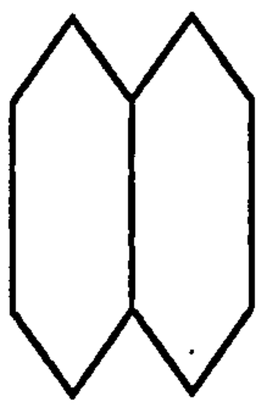
3 In this unit, only ***balance*** is included; ***simplicity*** will be discussed in unit 10.

Balance is the resolution of tension, opposing 'forces' that are matched to give equilibrium a sense of harmony. Certainly, the eye and brain need equilibrium, but it needs to be treated with some caution. Balance, like other Gestalt laws, is not an end in itself, but a means to an end.

The second part of the unit introduces learners to general concepts of contours, including common contours, subjective contours, Mach bands, visual vibrations and photographic edge effects.

Contrast (density differences) between adjacent areas in an image allows us to see contours or edges. The sharper the edge the higher the contrast appears, and vice versa. Sharp edges seem to advance while soft edges seem to recede. Therefore, using selective focus to control the sharpness of an edge controls, to a certain extent, contrast and depth. We should bear in mind that the judgment of sharpness is strictly visual (Zakia, 1999: p.120).

Common contour (see illustration below) provides us with an opportunity to create tension and uncertainty to our photographs, since there is a competition between the two shapes sharing the same contour. Arnheim refers to this competition as **contour rivalry** (1974: p.223). It tends to visually activate the image, increasing its diversity. A bit of tension and ambiguity in an image is a useful thing; it invites the viewer to participate more deeply in the visual experience (Zakia, 2002: p.157).



- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the core concept of the psychology of art — **balance.**	● apply the concept of pictorial balance to analyze images. ● apply the concept of pictorial balance to produce images.
An introduction to the general concepts of contours, including common contours, subjective contours, Mach bands, visual vibrations, and photographic edge effects.	● support analysis of the uncertain or playful effect in an image with the concept of common contour. ● create an image that shows the effect of common contours on uncertainty and on activating the image.
Textbook: Chapter 5 of Imaging and Perception (Zakia, 1999); Chapter 1 of Art and Visual Perception (Arnheim, 1974). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 10: The third photography session

- **Description of unit**

This unit, a photography project, aims to develop learners' understanding of the fundamental principles of photographic composition — balance and contrast. **Balance** is the harmonious relationship between opposite elements. Since the eye and brain are always seeking harmony, there is a sense of equilibrium and ease if the balance is achieved. If not, a sense of visual tension emerges, although it can be very useful in making a picture more dynamic. **Contrast** is closely related to balance; it emphasizes the differences between visual elements in a picture, e.g. contrast of quantity, tone or color. Two contrasting components reinforce each other (Freeman, 1988: p.6). To a certain extent, contrast can be seen as the **'breaking'** of balance. It could make the image more vivid. This project comprises two main sections:

The first section is balance. Students are requested to produce first photographs with a sense of static balance, and second photographs that leave more space for the eye to work at, that is, photographs that evoke the feeling of opposition and participation — dynamic balance (see **Unit 9**). The former is rather easier, placing the subject right in the middle of a frame, or several visual elements equally around the center. The latter is of the opposition of unequal weights and forces, and in doing so enliven the image (Freeman, 1988: p.22).

The second section is contrast. This section is in two parts. The first asking students to produce pairs of photographs that contrast with each other. The second part is to combine the two poles of the contrast in one photograph, an exercise that calls for a great deal of imagination.

- **Teaching objectives and assessment criteria**

<table>
<tr><th>Teaching objectives</th><th>Assessment criteria
The extent to which the student can:</th></tr>
<tr><td rowspan="2">An introduction to the fundamental principles of photographic composition—balance (see Unit 9) and contrast. Contrast stresses the differences between visual elements in a picture, while balance emphasizes the harmonious relationship between opposed elements.</td><td>● concerning the assessment criteria for balance, please refer to Unit 9.</td></tr>
<tr><td>● apply the concept of contrast to analyze images.
● apply the concept of contrast to create images.</td></tr>
<tr><td colspan="2">Textbook: Image: Designing effective pictures (Freeman, 1988).
Materials: The teacher's handouts; digital cameras and memory cards.
Coursework:</td></tr>
</table>

Unit 11: Illusion and simplicity

- **Description of unit**

The unit starts with a one-hour seminar for the preceding photography session (see Unit 4).

Illusions are defined as experiences that are not in accord with physical reality. There can be a difference between our physical reality (what we know to be) and perceptual reality (what we see). Usually when we think of illusions we think of visual illusions since vision is our dominant sense. The image on the retina is not what we see; it is only the first step in the perceptual process. What we see is the result of millions of nerve cells exchanging information in the cerebral cortex of the brain.

This unit explains why we see illusions the way we do. There are many types of visual illusions, but most can be grouped into three general categories: ***geometric, chronometric*** *(time and movement), and* ***colorimetric*** *(color is a chameleon).* **The unit starts** with a well-know geometric illusion, i.e. the Hering illusion (see figure A1).

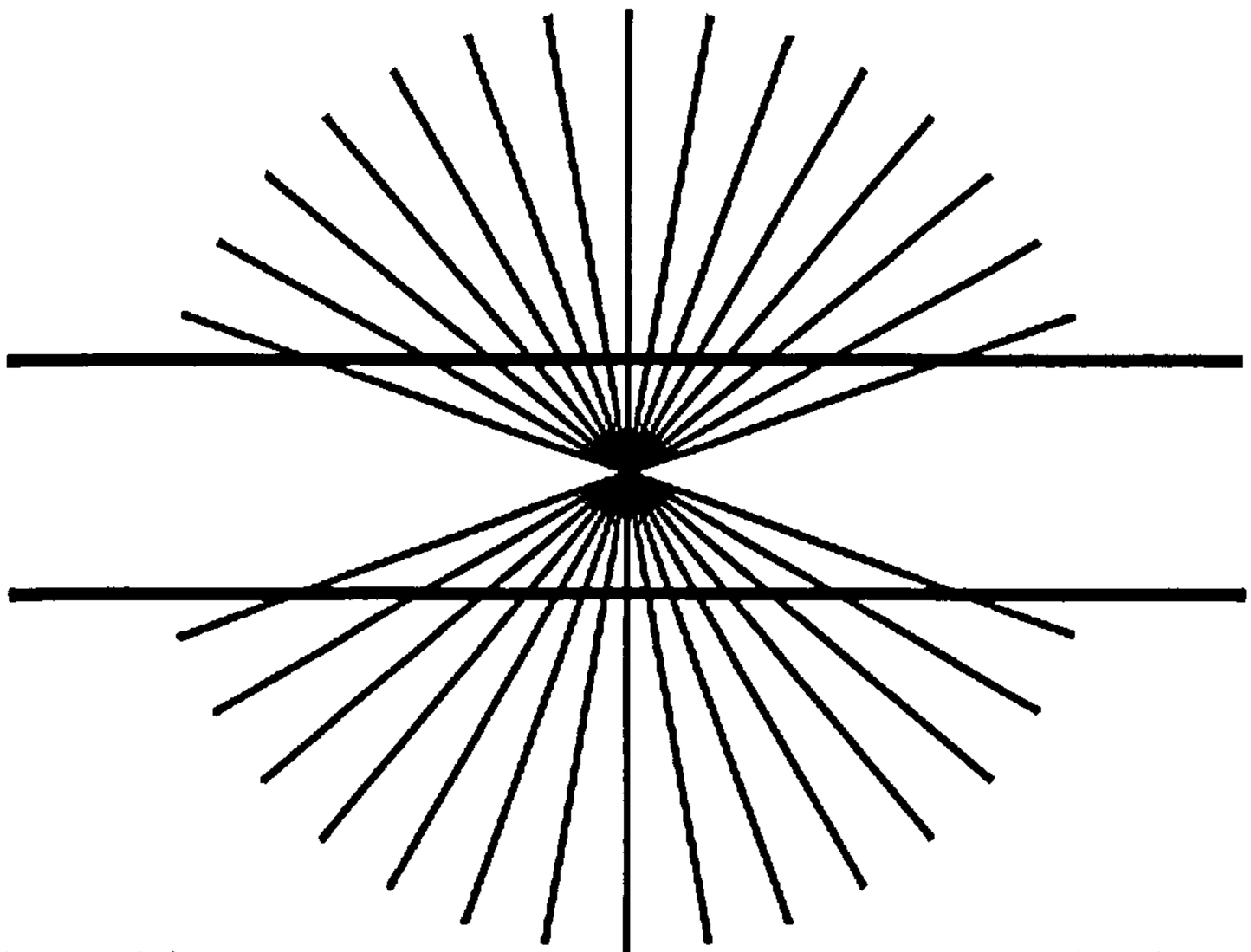


Figure A1 Hering illusion.

Figure A1 shows the perceived shape of a pair of parallel, horizontal lines can be changed by a set of angular, concentric background lines. In the Hering illusion, horizontal lines bend and become convex depending on how the background lines intersect the horizontal lines that are seen as figure (Zakia, 1999: p.140). Gestalt psychologists believe that in looking at something we tend to see it in such a way that it will cause the least amount of **visual tension**. Based on this principle, Arnheim argues:

"An objectively straight line crossing a sunburst of radii bends toward the center. In this case the centric, expanding pattern creates an inhomogeneous field, in which objective straightness is no longer as devoid of tension as it would be in a homogeneous field (b) **[figure A2]**. *Its equivalent in the centric field would be a circular line (Figure 262c)* **[figure A3]** *because all sections of such a line would be in the same relation to the field and to its center. The straight line in a* **[figure A1]**, *on the other hand, change angle, size, and distance from the center in each of its sections. To the extent that the line gives in to the tendency toward tension-reduction we see it curving,"* (Arnheim, 1974: p.420).

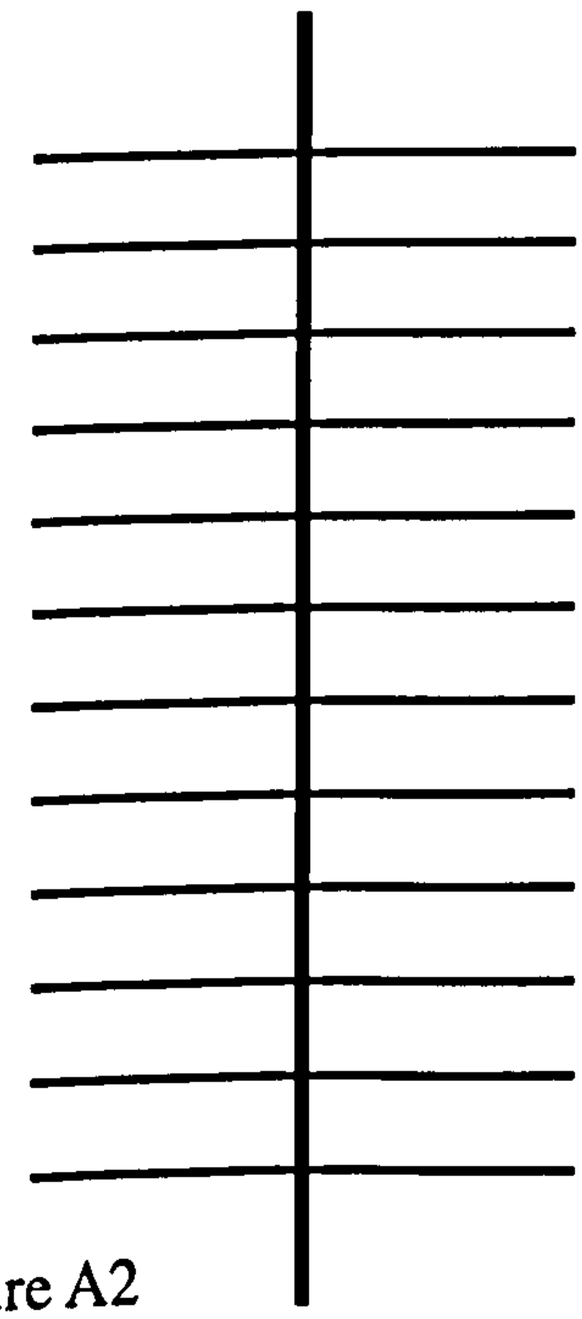


Figure A2

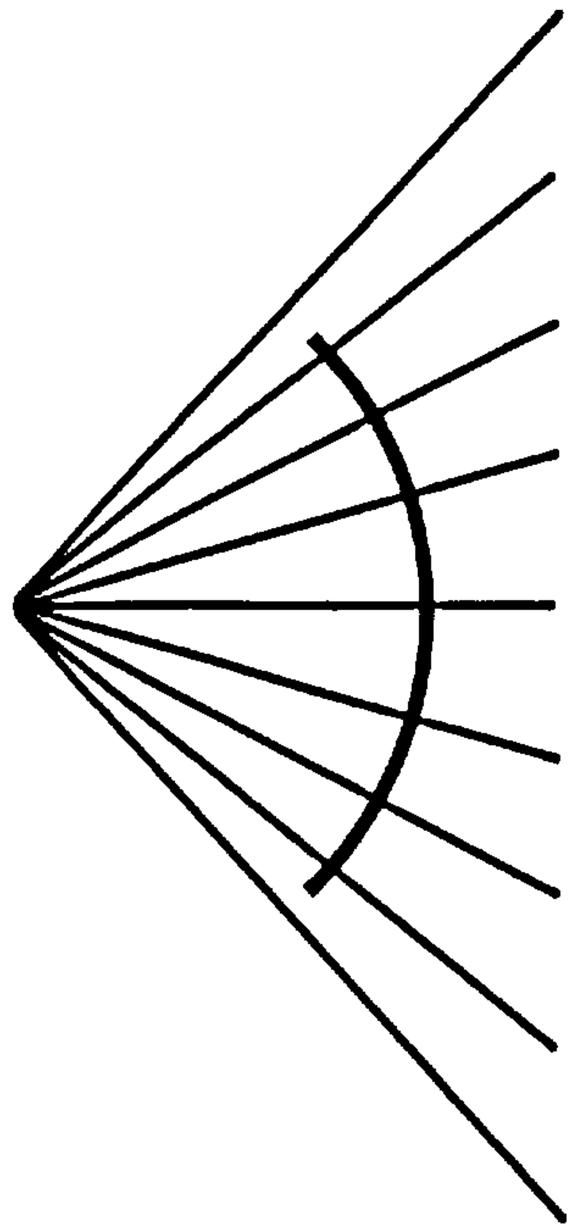


Figure A3

Although the stimulus quality of straightness is too strong to yield a complete transformation from a straight line to an arc, all sections of such a perceived line show a tendency to reach the simplest relation to the radii and to its center (distance and angle), that is, a tendency towards a simple whole. Phenomena of this kind find its explanation in what Gestalt psychologists describe as the basic law of visual perception — the **law of simplicity**[4]: *Any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the given conditions permit* (Arnheim, 1974: p.53).

The second part of the unit introduces learners to a variety of time and movement illusions, including motion pictures, computer animations, the Pulfrich effect and the Waterfall effect. The teacher explains to learners that the basis of movement illusions is the **phi phenomenon,** that is, two fixed lights blink in a dark room at short intervals (between 30 and 200 milliseconds) will appear to be one light in motion. This means that "*the movement detectors of the visual system are triggered as effectively by a closely spaced pair of lights alternately going on and off as by a single light moving back and forth*" (Britannica 2006).

The third part of the unit aims to extend learners' knowledge in color reproduction. The color of an object is highly dependent on its surround (see unit 8). This phenomenon can be used to overcome some of the physical limitation of reproducing certain colors. For example, a video screen is not capable of reproducing an aquamarine color correctly and one way to overcome this problem is to change the surround. A red surround can strengthen the hue, saturation and brightness of the aquamarine color, and make it appear more correctly (Zakia, 1999: p.146).

Knowledge of visual illusions provides explanations concerning why contradictions between one's physical reality and one's perceptual reality are part of our experience; this knowledge can be useful to learners in creating images that challenge physical constraints.

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[4] The law of simplicity is also called **the law of Pragnanz.** The German word Pragnanz indicates the tendency, noticed in experiments with Gestalts, for configurations to be given their most concise and clearly definable interpretations **(Oxford English Dictionary on CD-ROM, 3rd version).**

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The extent to which the student can:
An introduction to the many types of visual illusions, including space, time (movement), and color illusions. It is followed by an detailed explanation of why we see illusions the way we do, using what Gestalt psychologists describe as the basic law of visual perception — **the law of simplicity.**	• apply the concept of *simplicity* to describe and explain varied illusions in an image. • apply the concept of *simplicity* to create images. • apply the concept of *past experience* to analyze or create images.
Textbook: Chapter 6 of Imaging and Perception (Zakia, 1999); Chapter 2 of Art and Visual Perception (Arnheim, 1974). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 12:

- **Description of unit**

This is the last week and also the final unit of the term. Every student in the class will submit the result of his or her final project — an electronic portfolio. The formal structure of the portfolio is shown in table A6. As in the photography sessions, there is no lecture in this unit. After handing in their portfolios, students are free to leave the classroom, and this marks the end of a semester.

Structure of the Portfolio	Photograph	At least 20 photographs should be included in a portfolio. In addition, technical information such as aperture, shutter speed, ISO and date has to be provided for each photograph in the portfolio.
	Self-evaluative essay	Each photograph should be supported by a self-evaluative essay, consisting of at least 100 words. In the essay, the student analyzes and critiques his or her photographs using Gestalt theory.

Table A6 The required format of the final portfolio.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** The teacher should:
There is no lecture in this unit. Every student will submit the result of his or her final project – an electronic portfolio.	• apply all the criteria holistically, judging all photographs in the portfolio as a whole along three dimensions: Photographic Technique, Theory analysis, and Theory Application, and giving each dimension a score. Afterward, the individual scores are averaged into a summative score.
Textbook: **Material:** **Coursework:**	

6. Scoring guidelines

The primary purpose of developing the curriculum-oriented assessment criteria for the course units is to strengthen the links between the teaching and assessment. In order to reduce the teacher workload and increase the effectiveness of the evaluation and scoring process, *an analytical scoring rubric* has been devised to help the teacher to assess and score student work (see table A7). In the evaluation process, the domain of assessment is divided into three dimensions: Photographic Technique, Theory Analysis and Theory Application[5], and each dimension is further divided into five hierarchical levels of performance.

Table A7 The analytic scoring rubric of "Image

First Dimension: Photographic Technique (refer to criteria in Unit 3, 7, 8) To what extent can the student apply photographic techniques (appropriate choice of aperture, shutter speed, white balance, and ISO) to produce photographs?	
Excellent 4	Assignment exhibits thorough understanding and application of photographic skills to produce imaginative work.
Very Good 3	Assignment exhibits a good ability to utilize photographic skills required for the subject matter.
Satisfactory 2	Assignment exhibits a certain amount of application of photographic skills, but some may not be appropriately related to the subject matter.
Inadequate 1	Assignment exhibits some errors in applying photographic skills.
No Response 0	Assignment exhibits no regard to application of photographic skills.
Score: _____	

5 Because the assessment criteria in units 1-12 can be group precisely into 3 dimensions: Photographic Technique, Theory Analysis, and Theory Application.

Second Dimension: Theory Analysis (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11) To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to analyze photographs?	
Excellent **4**	Assignment exhibits thorough understanding and application of multiple theories to perform a comprehensive analysis.
Very Good **3**	Assignment exhibits a good ability to utilize relevant theories to perform an appropriate analysis.
Satisfactory **2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate **1**	Assignment provides some descriptive accounts of theories which are not relevant to the work.
No Response **0**	Assignment does not utilize theories to analyze photographs.
Score: _____	

Third Dimension: Theory Application (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11) To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to produce photographs?	
Excellent **4**	Assignment exhibits thorough understanding and application of multiple theories to produce imaginative work.
Very Good **3**	Assignment exhibits a good ability to utilize relevant theories required for the subject matter.
Satisfactory **2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate **1**	Assignment exhibits some unsuccessful attempts to apply theories because of misunderstanding.
No Response **0**	Assignment exhibits no regard to application of theories.
Score: _____	

While assessing a student's assignment, the teacher should apply all the criteria per dimension holistically, judging all works as a whole and giving a score for each dimension. The reasons for adopting the analytical scoring rubrics are:

- The great virtue of analytic scoring is its diagnostic capability, because it can provide students and the teacher with useful feedback along each dimension. On the other hand, a single score for all aspects of a student's work (holistic scoring) does not reflect the quality of the product (Armstrong, 1994: p.149). This scoring rubric (table A7) is actually a hybrid of the two types, since the teacher also has to assign an overall, or integration score to each assignment for statistical purposes, and also in order to fulfill university regulations.

- Concerning the reliability of the self-developed assessment criteria. The same student portfolio will be judged and scored independently by the teacher and a second assessor with a similar background in photographic education. Because the rubric descriptors offer the assessors explicit scoring standards, it is very helpful to ensure consistency between the assessors — inter-assessor reliability.

Before the formal adjudication, the two assessors score independently six sample portfolios, selected from previous student works, to determine whether the criteria and level descriptors are practical to use and also help the raters arrive at consensus on what scores they would assign to a given work. If there is no consensus, having the assessors discuss and explain their scores can be instrumental in clarifying the rubrics and fostering uniform scoring (Web Page: Introduction to scoring rubrics). The teacher can then make any necessary revisions.

Appendix B: The teaching programme for 'Image Aesthetics', February 2006

This appendix provides a revised version of the teaching programme described in Appendix A. The new version features a few revisions to the previous one, aiming for further improvement in teaching and learning. Since most components of the two programmes are the same, descriptions in this part are confined to the sections that are different from those of Appendix A.

1. Structure of the curriculum

Unit/Time		**Course content**	
1st unit	1st week	Introduction to the course.	
2nd unit	2nd week	Visual selection: *figure* and *ground*; workshop.	
3rd unit	3rd week	1st photography session: Coursework, an electronic portfolio.	
4th unit	4th week	Gestalt Grouping; Diary inspection date (5th week).	
	5th week		
	6th week		
5th unit	7th week	Memory and association; workshop.	
6th unit	8th week	Midterm presentation.	
	9th week		
7th unit	10th week	2nd photography session: Coursework; Diary inspection date.	
8th unit	11th week	Space, time and color.	
	12th week		
9th unit	13th week	Contours; workshop (14th week).	Art psychology session: Balance.
	14th week		Art psychology session: Balance.
10th unit	15th week	3rd photography session: Coursework; Diary inspection date.	
11th unit	16th week	Illusion and Ambiguity.	Art psychology session: Simplicity.
	17th week		Art psychology session: Past experience.
12th unit	18th week	Term project: an electronic portfolio; Submission of learning diary.	
Textbooks		• Arnheim, R. (1974) Art and Visual Perception. University of California Press. • Gombrich, E. H. (1998) The Story of Art. • Zakia, R. D. (2002) Perception and Imaging, 2nd edition. Focal Press.	

Table B1 A structured syllabus for Image Aesthetics.

This section contains the structure and content, i.e. the syllabus, of 'Image Aesthetics'. The course was offered twice in an academic year, once per semester. Each semester in general covered 18 weeks of classes, and each class lasted three hours. The course was divided into 12 connected units; some units take more teaching hours than others. Below is the syllabus for 'Image Aesthetics' for the second semester of the academic year 2005-6, i.e. *the duration of the main study*, which started in February 2006 and ended in June 2006.

2. Unit format

Each course unit is set out in the following way.

- Description of unit:

  A brief description of the course content of the unit is given, together with the key areas of study associated with the unit.

- Teaching objectives (expected learning outcomes) and assessment criteria:

  Each unit contains the statements of the objectives that each student is expected to achieve against certain criteria (see table B2 for an example).

  The relevant information about textbook, materials and coursework is also included in this section (table B2).

Teaching objectives	Assessment criteria To what extent the student can:
An introduction to the concept of figure and ground, using examples from graphic design, psychology, photography, and works of art.	● apply the concept of figure and ground, that is, figure-ground enhancement, to analyze or produce images.
Textbook: Chapter 1 of Imaging and Perception (Zakia, 1999). **Material:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Table B2

3. Teaching

The concept of Gestalt grouping of visual elements is at the core of the curriculum. Units of the course are closely related to each other, forming a coherent whole. Each lesson consists of two main sections: the teacher's lecture and the students' group discussions. The ratio of the amount of time on lecture to discussion is approximately four to one. The teacher plays a leading role in the first section of a lesson, offering and commenting on a range of rich visual experiences, e.g. using Microsoft PowerPoint slide shows instead of printed materials. The second part is the group discussion. The students form groups, usually 3 to 6 students in a group, to discuss course content or questions raised by the teacher which are aimed to stimulate thought. During the discussion, the teacher participates in each group and offers useful feedback. Before finishing the class, the teacher randomly selects students from several groups (one student from each group) to present their learning outcomes. The foregoing process is revealed in table B3.

Teacher's Lecture (80%)	The teacher plays a leading role in the first section of a lesson, offering and commenting on a range of rich visual experiences, e.g. using Microsoft PowerPoint slide shows instead of printed materials.	
Group Discussion (20%)	**Discussion**	The students form groups, usually 3 to 6 students in a group, to discuss course content or questions raised by the teacher. During the discussion, the teacher participates in each group and offers appropriate advice.
	Presentation	Before finishing the class, the teacher randomly selects students from several groups (one student from each group) to present their learning outcomes.

Table B3. The structure of a lesson.

4. Learning and assessment

As seen in table B2, each course unit contains expected learning outcomes and related criteria for assessment. These criteria are used to measure the effectiveness of student learning. They need to be used alongside the criteria of other units to assess student performances in their coursework, presentations and final portfolios. The teacher should apply the criteria holistically to judge all the works in a portfolio or presentation rather than focus on a single photograph or some photographs exclusively. When assessing student performance, the criteria are to be used as guidelines and reviewed on a regular basis. Therefore, the teacher's own intuitive and experiential understanding of student performance against certain criteria still plays a very important role in the evaluation process.

5. A learning diary

To be able to gain useful insight into students' photography learning experiences, and also to address potential problems arising from the course, the teacher plans to invite student volunteers to participate in a diary study. In the diaries, learners make comments about their experiences in or after class on a regular basis. Since keeping a diary can be time-consuming, there will be no rules about what a student should write or how much he or she should write. The amount and content will depend on what they are interested in or confused about and the time at their disposal. However, given my evaluation objectives, I do provide a few guidelines, such as "What have I learned in this week?", "Are the visual teaching materials easy to absorb?", and "Are there enough photography sessions for me?" and so on. These are provided at the bottom of the diary page as hints as to how they might proceed (see table B4 — a sample page). In the fifth, tenth and fifteenth weeks, the students are asked to submit their diaries, and the teacher will give each student some feedback on his or her task. At the end of a term, the students submit their diaries. During the course, the teacher also keeps a journal of his reflections on teaching and classroom observation.

The Learning Diary for 'Image Aesthetics' 1st week		
Name:	**Department and Year:**	**Course content:**

Hints: What have I learned in this week? Are the lectures easily understood? Are the visual teaching materials easy to absorb? Is there anything the teacher should add to the curriculum? What have I learned in the photography sessions? Are there enough photography sessions for me? Have I experienced any difficulties with theoretical concepts? How can I apply theoretical concepts to my practical work? *These are provided only as guidelines; you are very welcome to provide your own reflections on the course.*

Table B4 A sample page of the learning diary.

6. Units

Only the units that are different from Appendix A, i.e. Unit 2, 5 and 9, are presented.

Unit 2: Visual selection—*figure* and *ground*

- **Description of unit**

A one-hour workshop is held the week before the photography session, aiming to help students access course content and practise relevant photographic techniques in advance.

Each image we encounter in our daily lives possesses a pair of distinguishable attributes: figure and ground. This unit explores the concept of figure-ground relationships carefully by offering many graphic examples. The relationship between figure and ground is usually reversible where figure can become ground and ground, figure. It is to be borne in mind that the concept is not limited to visual perception. Since all of our senses are tied into the same central nervous system (the brain), it is quite normal that a concept such as figure-ground should be valid for all senses (Zakia, 1999: p.13).

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** **To what extent the student can:**
An introduction to the concept of figure and ground, using examples from graphic design, psychology, photography, and works of art.	• apply the concept of figure and ground, that is, figure-ground enhancement, to analyze or produce images.
Textbook: Chapter 1 of Imaging and Perception (Zakia, 1999). **Material:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 5: Memory and association

- **Description of unit**

A one-hour workshop is held the week before the photography session, aiming to help students access course content and practise relevant photographic techniques in advance.

Memory is an integral part of perception. It is much easier to see what we know, what is stored in memory, than to see what we do not know, what is not in memory. This unit focuses on the close relationship between memory and perception, and varied ways of association that deepen and internalize our memory and therefore, our perception. It comprises two connected sections:

The first section introduces learners to ideas about how different forms of memory affect our perception, including an introduction to short-term/long-term memory, visual memory and color memory.

The second focuses on the *signifiers* or *metaphors* which have associative value that links memory with perception, including advertisements, props, colors, equivalents, synesthesia and onomatopoeia.

- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** **To what extent the student can:**
An introduction to the different forms of memory which affect perception, including short-term/long-term memory, visual memory and color memory.	• support analysis of the meaning or effect of an image with the concept of association. • produce work with associative value that links memory with perception.
An introduction to the signifiers or metaphors which have associative value that links memory with perception, including advertisements, props, colors, equivalents, synesthesia and onomatopoeia.	
Textbook: Chapter 3 of Imaging and Perception (Zakia, 1999). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

Unit 9: Balance, Contours

- **Description of unit**

A one-hour workshop is held the week before the photography session, aiming to help students access course content and practise relevant photographic techniques in advance.

This unit starts to incorporate **art psychology lessons** into normal sessions; these lessons are held in a four-week period of time, each lesson lasting an hour. The aim of the extra lessons is to introduce the core concepts of the psychology of art: **balance** and **simplicity**[1]. These lessons are based on Rudolf Arnheim's book, *Art and Visual Perception*. Working from a Gestalt frame of reference Arnheim argues, as do other Gestalt psychologists, that pictorial balance is basically indispensable. The reasons why the lessons are not separated from normal lessons and form a single unit are: firstly, it is quite difficult for novice photographers to understand Arnheim's sophisticated theories within a short period of time, say, 1 to 2 weeks and secondly, the close relationship between the course and certain psychological theories for example, **illusion** and **simplicity** (which will be described next unit) has to be taken into account,. Therefore, lecture hours are separated into two sections: first balance; second contours.

The first section of the unit starts with the introduction of pictorial balance, including *static balance* and *dynamic balance*. Dynamic balance tends to be more interesting than static one since too static a balance leaves less for the viewer to work at (Freeman, 1988: p.26). Afterwards, the teacher uses the concept of Gestalt field forces to explain explicitly what we mean by balance (equilibrium) in a picture and why this balance is indispensable. Visually as well as physically, balance is the state of distribution in which all psychological forces (and the corresponding physiological forces in the nervous system) compensate one another, resulting in the standstill of all "visual action" (Arnheim, 1974: p.20).

"In a balanced composition all such factors as shape, direction, and location are mutually determined in such a way that no change seems possible, and the whole assumes the character of 'necessity' in all its parts" (ibid, p.20).

---

[1] In this unit, only ***balance*** is included; ***simplicity*** will be discussed in unit 10.

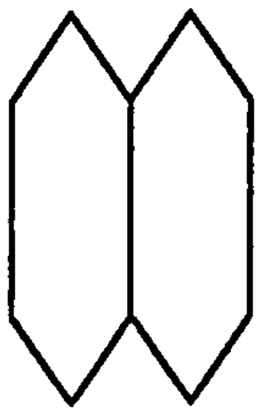
In other words, under conditions of imbalance, the artistic intent becomes incomprehensible, because the elements of an unbalanced composition show a tendency to change place or shape (visually rather than physically) in order to reach a state that better accords with the total structure – the whole (ibid, p20).

Balance is the resolution of tension, opposing 'forces' that are matched to give equilibrium or a sense of harmony. Certainly, the eye and brain need equilibrium, but the idea needs to be treated with some caution. Balance, like other Gestalt laws, is not an end in itself, but a means to an end.

The second part of the unit introduces learners to general concepts of contours, including common contours, subjective contours, Mach bands, visual vibrations, and photographic edge effects.

Contrast (density differences) between adjacent areas in an image allows us to see contours or edges. The sharper the edge the higher the contrast appears, and vice versa. Sharp edges seem to advance while soft edges seem to recede. Therefore, using selective focus to control the sharpness of an edge controls, to a certain extent, contrast and depth. We should bear in mind that the judgment of sharpness is strictly visual (Zakia, 1999: p.120).

Common contour (see illustration below) provides us with an opportunity to create tension and uncertainty in our photographs, since there is a competition between the two shapes sharing the same contour. Arnheim refers to this competition as **contour rivalry** (1974: p.223). It tends to visually activate the image, increasing its diversity. A bit of tension and ambiguity in an image is a useful thing; it invites the viewer to participate more deeply in the visual experience (Zakia, 2002: p.157).



- **Teaching objectives and assessment criteria**

Teaching objectives	**Assessment criteria** **To what extent the student can:**
An introduction to the core concept of the psychology of art – **balance.**	● apply the concept of pictorial balance to analyze images. ● apply the concept of pictorial balance to produce images.
An introduction to the general concepts of contours, including common contours, subjective contours, Mach bands, visual vibrations, and photographic edge effects.	● support analysis of the uncertain or playful effect in an image with the concept of common contour. ● create an image that shows the effect of common contours on uncertainty and on activating the image.
Textbook: Chapter 5 of Imaging and Perception (Zakia, 1999); Chapter 1 of Art and Visual Perception (Arnheim, 1974). **Materials:** The teacher's handouts (printed matter and electronic files). **Coursework:**	

TEXT BOUND INTO

THE SPINE

Appendix C: The Scoring Sheet of Image Aesthetics

First Dimension: Photographic Technique (refer to criteria in Unit 3, 7, 8)
To what extent can the student apply photographic techniques (appropriate choice of aperture, shutter speed, white balance, and ISO) to produce photographs?

Assessment criteria

The extent to which the student can:

- adjust aperture appropriately to acquire a desirable depth of field.
- control shutter speed appropriately to capture the moment or to suggest movement.
- adjust white balance appropriately to obtain a better color reproduction.
- adjust ISO appropriately to obtain a more favorable aperture or shutter speed.
- use techniques such as a slow shutter speed, slight out of focus, panning a moving object, or multiple exposures to suggest movement in a still image.
- judge whether an image is ideally exposed.
- produce ideally exposed images consistently.

Scale 1: Photographic Technique

Excellent	**4**	Assignment exhibits thorough understanding and application of photographic skills to produce imaginative work.
Very Good	**3**	Assignment exhibits a good ability to utilize photographic skills required for the subject matter.
Satisfactory	**2**	Assignment exhibits a certain amount of application of photographic skills, but some may not be appropriately related to the subject matter.
Inadequate	**1**	Assignment exhibits some errors in applying photographic skills.
No Response	**0**	Assignment exhibits no regard to application of photographic skills.

Dimension Score : _____
Overall Comment: _____
_____

Second Dimension: Theory Analysis (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11)
To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to analyze photographs?

Assessment criteria

The extent to which the student can:

- apply the concept of figure and ground, that is, figure-ground enhancement, to analyze images.
- apply the 4 basic laws of Gestalt grouping (the law of *proximity*, *similarity*, *continuity* and *closure*) to analyse images.
- support analysis of the meaning or effect of an image with the concept of association.
- support analysis of the feeling of depth in an image with the concept of perspective.
- make colors more saturated, and thus make the composition of a picture more dramatic, by making color complements as part of the visual design and analysis.
- apply the concept of pictorial balance to analyze images.
- support analysis of the uncertain or playful effect in an image with the concept of common contour.
- apply the concept of contrast to analyze images.
- apply the concept of *simplicity* to describe and explain varied illusions in an image.
- apply the concept of *past experience* to analyze images.

Scale 2: Theory Analysis

Excellent	**4**	Assignment exhibits thorough understanding and application of multiple theories to perform a comprehensive analysis.
Very Good	**3**	Assignment exhibits a good ability to utilize relevant theories to perform an appropriate analysis.
Satisfactory	**2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate	**1**	Assignment provides some descriptive accounts of theories which are not relevant to the work.
No Response	**0**	Assignment does not utilize theories to analyze photographs.

Dimension Score : _____
Overall Comment: _____
_____

Third Dimension: Theory Application (refer to criteria in Unit 2, 4, 5, 8, 9, 10, 11)
To what extent can the student apply Gestalt concepts (the law of proximity, similarity, closure, and simplicity, etc.) to produce photographs?

Assessment criteria

The extent to which the student can:

- apply the concept of figure and ground, that is, figure-ground enhancement, to produce images.
- apply the 4 basic laws of Gestalt grouping (the law of *proximity*, *similarity*, *continuity* and *closure*) to produce images.
- produce work with associative value that links memory with perception.
- create the feeling of depth in an image through the use of perspective.
- make colors more saturated, and thus make the composition of a picture more dramatic, by making color complements as part of the visual design and analysis.
- apply the concept of pictorial balance to produce images.
- create an image that shows the effect of common contours on uncertainty and on activating the image.
- apply the concept of contrast to create images.
- apply the concept of *simplicity* to create images.
- apply the concept of *past experience* to analyze images.

Scale 3: Theory Application

Excellent	**4**	Assignment exhibits thorough understanding and application of multiple theories to produce imaginative work.
Very Good	**3**	Assignment exhibits a good ability to utilize relevant theories required for the subject matter.
Satisfactory	**2**	Assignment exhibits a certain amount of application of theories, but some may not be appropriately related to the subject matter.
Inadequate	**1**	Assignment exhibits some unsuccessful attempts to apply theories because of misunderstanding.
No Response	**0**	Assignment exhibits no regard to application of theories.

Dimension Score : _____

Overall Comment: _____

_____

Appendix D: Five sample portfolios representing 5 different levels of performance

Portfolio A A sample page of a portfolio representing the lowest level of performance, that is, a score of 0.



- The picture is not in focus because there was something wrong with my right hand [arm].
- The tree in the middle is brighter than the others, and it is the only tree surrounded by stones.

[…]: annotation(s) by the teacher.

Portfolio B A sample page of a portfolio representing the second lowest level of performance, that is, a score of 1.



The block in the background tilts towards the left that makes the composition somewhat imbalanced, but trees in the centre and on the left are rightward slanted that [helps to] compensate for the effect. However, [I sense that] the picture as a whole is still not balanced.

1/50s, f2.8, ISO100

[…]: annotation(s) by the teacher.

Portfolio C A sample page of a portfolio representing the medium level of performance, that is, a score of 2.

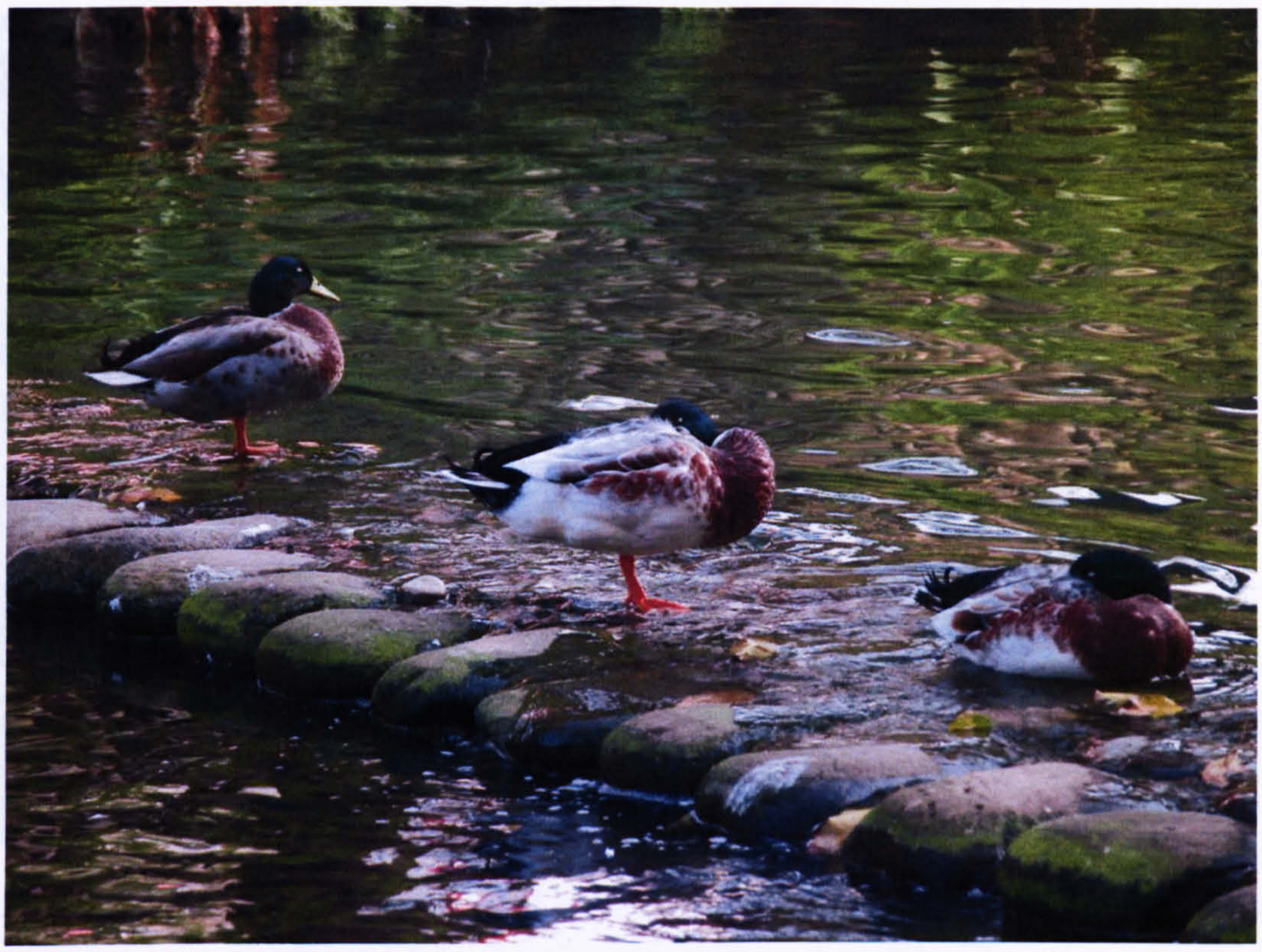


- [The law of] Similarity: The bridge and its reflected image and the stone barrier [at the bottom-right corner] are all arc-shaped.
- The three [the bridge, the reflected bridge, the stone barrier] are of different colors and orientations, which provide interesting contrasts [in the picture]. The stone barrier is placed on the point of the rule of thirds. The arc shape of the barrier can be seen as convex, and it is experienced as pushing out, leading the eye to the bridge and its reflected image.

1/125s, f5.3, ISO50, East Gate Water Park

[…]: annotation(s) by the teacher.

Portfolio D A sample page of a portfolio representing the second highest level of performance, that is, a score of 3.



These 3 ducks can be easily grouped together because they are the same species and have similar colors [Gestalt grouping]. Although they are ducks of the same kind and [their bodies] are facing the same direction, there are subtle differences, namely the fact that each duck adopts a different body posture, which can be noticed after taking a close look.

1/60s, f4.1, ISO100, [Three Ducks on] A City Moat

[…]: annotation(s) by the teacher.

Portfolio E A sample page of a portfolio representing the highest level of performance, that is, a score of 4.



The color difference between figure and ground, and the contrast between the smooth shape of the squirrel and the rough texture of the trunk, together they all help to make this picture more vivid.

The squirrel is positioned in the tree hole in such a way that the viewer is invited to complete the partially covered head and front leg to form a whole, through which closure is achieved. Closure provides an opportunity for viewer participation. It allows the viewer to complete the contours of the animal, and this completeness or closure makes an amusing composition that gives meaning to this picture: the squirrel is eagerly searching for something in the tree hole. Human beings derive satisfaction from being able to form a closure that allows them to become active participants in the visual experience [The second paragraph is a template provided by the teacher].

1/100s, f5.6, ISO320, Hiding Squirrel

[…]: annotation(s) by the teacher.

Appendix E: The coding system for the learning diary

Part A: The Development of the Coding System (main categories in bold type)

Coding scheme: the 1st version		Coding scheme: the 2nd version	
Main category	**Theoretical analysis:** apply Gestalt principles to the appreciation and analysis of photographs.	**Main category**	**Theoretical analysis:** Apply Gestalt principles to the appreciation and analysis of photographs.
Sub-category	• I like it • Theoretical difficulties • Theoretical understanding • Conscious looking	Sub-category	• "I like it" is renamed "Emotive response" • Theoretical difficulties • Theoretical understanding • Conscious looking
Main category	**Theoretical application:** Apply Gestalt principles to the production of photographs.	**Main category**	**Theoretical application:** Apply Gestalt principles to the production of photographs.
Sub-category	• Acute sense of images • Theoretical application	Sub-category	• Acute sense of images • "Theoretical application" is renamed "Theoretical reflection" (because i a diary, it seems difficult for the student to write about applying theories to produce photographs).
Main category	**Artistic perspective**	**Main category**	**Artistic perspective**
Sub-category	• In pursuit of beauty • Having an intention	Sub-category	• Merge "In pursuit of beauty" and "Having an intention" into one category: "Having an intention".
Main category		**Main category** (new)	**Things I can't yet place:** This is a temporary category in which there are a few sub-categories that I do not know under which main category they should go.
Sub-category		Sub-category	• Nature of photography: • Character of the teacher: Any text about a description of the teacher's personal characteristics such as earnest, humor or consideration. • Thoughts on course content: Any text about an understanding of or a reflection on non-Gestalt course content.

Coding scheme: the 2nd version		Coding scheme: the 3rd version	
Main category	**Theoretical analysis:** Apply Gestalt principles to the appreciation and analysis of photographs.	**Main category (new)**	**Course Characteristics:** Any text about general response to the teacher, non-Gestalt course content, or course activities.
Sub-category	• Emotive response • Theoretical difficulties • Theoretical understanding • Conscious looking		• Informal consultation • Group discussion • Photography seminar • Midterm presentation • Photography session
Main category	**Theoretical application:** Apply Gestalt principles to the production of photographs.	**Main category**	**Theoretical application:** Apply Gestalt principles to the production of photographs.
Sub-category	• Acute sense of images • "Theoretical application" is renamed "Theoretical reflection" (because in a diary, it seems difficult for the student to write about applying theories to produce photographs).	Sub-category	• Acute sense of images • Theoretical reflection
Main category	**Artistic perspective**	**Main category (new)**	**Things I can't yet place:** This is a temporary category in which there are a few sub-categories that I do not know under which main category they should go.
Sub-category	• Merge "In pursuit of beauty" and "Having an intention" into one category: "Having an intention".	Sub-category	• Nature of photography • Character of the teacher • Thoughts on course content
Main category (new)	**Things I can't yet place:** This is a temporary category in which there are a few sub-categories that I do not know under which main category they should go.	**Main category**	**Artistic perspective**
Sub-category	• Nature of photography: • Character of the teacher: Any text about a description of the teacher's personal characteristics such as earnest, humor or consideration. • Thoughts on course content: Any text about an understanding of or a reflection on non-Gestalt course content.	Sub-category	• Having an intention • Art appreciation (new)
Main category		**Main category (new)**	**Course expectation:** Any text about expectations of the course.

Coding scheme: the 3rd version		Coding scheme: the 4th version	
Main category (new)	**Course Characteristics:** any text about general response to the teacher, non-Gestalt course content, or course activities.	**Main category**	**Course Characteristics** is renamed **General response to the course:** Any text about general response to the teacher, non-Gestalt course content, or course activities.
	• Informal consultation • Group discussion • Photography seminar • Midterm presentation • Photography session		• Informal consultation • Group discussion • Photography seminar • Midterm presentation • Photography session • Character of the teacher (moved from **"Things I can't yet place"**) • Thoughts on course content (moved from **"Things I can't yet place"**) • Expectation of course (moved from **"Course expectation"**)
Main category	**Theoretical application:** Apply Gestalt principles to the production of photographs.	**Main category**	**Theoretical application:** Apply Gestalt principles to the production of photographs.
Sub-category	• Acute sense of images • Theoretical reflection	Sub-category	• Acute sense of images • Theoretical reflection
Main category (new)	**Things I can't yet place:** This is a temporary category in which there are a few sub-categories that I do not know under which main category they should go.	**Main category**	**"Things I can't yet place"** is cancelled.
Sub-category	• Nature of photography • Character of the teacher • Thoughts on course content	Sub-category	• Move Nature of photography under **"Artistic perspective"**. • Move Character of the teacher under **"General response to the course"** • Move Thoughts on course content under **"General response to the course"**.
Main category	**Artistic perspective**	**Main category**	**Artistic perspective:** Any text about the nature of photography, general intention or determination to produce good photographs, or the linkage between Gestalt theory and art.
Sub-category	• Having an intention • Art appreciation (new)	Sub-category	• Having an intention • Art appreciation • Nature of photography (moved from **"Things I can't yet place"**)
Main category (new)	**Course expectation:** Any text about expectations of the course.	**Main category**	**"Course expectation"** is renamed "Expectation of course" and moved under **"General response to the course"**. Because their expectations are all about responses to course content.

Coding scheme: the 4th version		Coding scheme: the 5th version	
Main category	**Course Characteristics** is renamed **General response to the course:** Any text about general response to the teacher, non-Gestalt course content, or course activities.	**Main category**	**General response to the course:**
Sub-category	• Informal consultation • Group discussion • Photography seminar • Midterm presentation • Photography session • Character of the teacher (moved from **"Things I can't yet place"**) • Thoughts on course content (moved from **"Things I can't yet place"**) • Expectation of course (moved from **"Course expectation"**)	Sub-category	*A new category* is created that merge the first five categories relating to course activities into one: "Course activity". At the moment, I keep the five categories under "Course activity" rather than delete them, because I perceive them as of different levels of importance. • Course activity • Character of the teacher • "Thoughts on course content" is renamed "Thoughts on the course" and redefined as: Any text about thoughts on non-Gestalt course content, teaching materials or teaching methods. • "Expectation of course" is Cancelled. • Comments on personal progress (new): Any text containing positive or negative comments on personal progress or performance.
Main category	**"Things I can't yet place"** is cancelled.	**Main category**	**"Technical skill"** is renamed **"Photographic technique"**: Any text about the development of photographic techniques, or difficulty in acquiring such techniques.
Sub-category	• Move Nature of photography under **"Artistic perspective"**. • Move Character of the teacher under **"General response to the course"**. • Move Thoughts on course content under **"General response to the course"**.	Sub-category	• Technical development • Technical difficulty
Main category	**Artistic perspective:** Any text about the nature of photography, general intention or determination to produce good photographs, or the linkage between Gestalt theory and art.	**Main category**	**"Image analysis and appreciation"** is renamed **"Image appreciation"**: Any text about the ability or lack of the ability to apply Gestalt principles to analyze and appreciate photographs.
Sub-category	• Having an intention • Art appreciation • Nature of photography (moved from **"Things I can't yet place"**)	Sub-category (Rename)	• "Emotive response" is renamed "Subjective judgment". • "Theoretical difficulty" is renamed "Theory difficulty". • "Theoretical understanding" is renamed "Theory understanding". • "Conscious looking" is cancelled.
Main category	**"Course expectation"** is renamed "Expectation of course" and moved under **"General response to the course"**. Because students' expectations refer to responses to course content.	**Main category**	**"Theoretical application"** is renamed **"Theory application"**.
Sub-category		Sub-category (Rename)	• Acute sense of image • "Theoretical reflection" is renamed "Theory reflection".

Coding scheme: the 5th version		Coding scheme: the 6th (final) version	
Main category	**General response to the course:**	**Main category**	**General response to the course:**
Sub-category	• Course activity • Thoughts on the course • Character of the teacher • Comments on personal progress	Sub-category	• Course activity • "Thoughts on the course" is renamed "Thoughts on non-Gestalt content" • Character of the teacher • Comments on personal progress • Teacher approval (new): Any text responding to the teacher's approval or lack of approval to the student's work or progress.
Main category	**Photographic technique**	**Main category**	**Photographic technique**
Sub-category	• Technical difficulty • Technical development	Sub-category	• Technical difficulty • Technical development
Main category	**Image appreciation**	**Main category**	**Image appreciation**
Sub-category	• Subjective judgment • Theory difficulty • Theory understanding	Sub-category (Rename)	• Subjective judgment • "Theory difficulty" is renamed "Difficulty with theory". • "Theory understanding" is renamed "Understanding of theory".
Main category	**Theory application**	**Main category**	**Theory application was renamed Application of theory**
Sub-category	• Acute sense of image • Theory reflection	Sub-category (Rename)	• Acute sense of observation • "Theory reflection" is renamed "Reflection on applying theory".
Main category	**Artistic perspective**	**Main category**	**Artistic perspective**
Sub-category	• Nature of photography • Having an intention • Art appreciation	Sub-category	• "Nature of photography" is **cancelled.** • Having an intention • Art appreciation: Any text showing an appreciation of art or relating Gestalt theory to art.

Part B: The final, comprehensive version of the coding system

There are 5 major themes and 14 subsidiary themes, all with definitions and some with examples.

1. General response to the course: Any text about general response to the teacher, non-Gestalt course content, or course activities.

- Course activities: Any text about thoughts on non-Gestalt course content, teaching materials or teaching methods.
  - Informal consultation: Any text about attitudes to the extracurricular consultations. Example: "It is very kind of the teacher to provide us with Tuesday consultations, aiming to help those students who needed help or fell behind the others. ... The consultation was very helpful both in discussing one's own photographs with the teacher and in observing the discussion between the teacher and another student" (F533).
  - Group discussion: Any text about attitudes to the group discussions. Example: "I was shocked when I saw the cameras of my classmates – many of them were DSLRs (Digital Single Lens Reflex), and then I realized that they were not novices. No wonder in [earlier] group discussions they could contribute some very good ideas that I had not thought about. This was one of the advantages of the group discussions as it made the course more diverse and interesting, and gave me some unexpected but useful knowledge" (M632).
  - Photography seminar: Any text about attitudes to the photography workshops, i.e. the usefulness of discussing or criticizing one's own work publicly. Example: "Today I was the first one presenting my work in public [in the photography seminar]. At the beginning I was quite nervous, but then I realized that it would be even more helpful if the teacher could have said more. ... Teacher Lu provided very clear explanations of the compositions [of our photographs], combined with the correction signs in the PowerPoint files that made his intention perfectly understandable. I wish to say thank you for giving me this chance to present my work, and I have learned a lot from this" (F018).
  - Midterm presentation: Any text about attitudes to the midterm presentations, i.e. the usefulness of presenting or criticizing one's own work publicly. Example: "During the presentations I found that everyone had made good progress in the quality of photographs and application of [Gestalt] theories. ... I think we can learn a lot of interesting stuff from the photographs of our classmates. Preparing the presentations was a bit painstaking, but in this way we were forced to practise taking pictures [?] repetitively. It is a bit like a check on our learning outcomes. Looking at others' photographs was not only interesting but also very helpful. Thank you [the teacher] for your thoughtfulness" (F018).
  - Photography session: Any text about attitudes to the photography workshop and photography session. Example: "There are certain ways to show a sense of depth [in a picture], that is, linear perspective, aerial perspective, relative size, interposition, shadow, texture gradient and cold/warm colors. We tried these methods immediately in the following photography workshop [the 3rd lesson in the same week]. Using cold and warm color perspective to show a sense of depth seemed the most difficult one, and only a few classmates managed to use this approach. Practice like this [practice immediately after lesson] was very effective, because we could apply what we had learned in the classroom to take pictures and get immediate feedback from the teacher" (F018).

- Character of the teacher: Any text about the teacher's personal characteristics. Example: "I really enjoyed the atmosphere of this course. The teacher was earnest in his work and humorous in every sense. I rarely see a teacher who cares so much about each student and never gives up on anyone. This is one of the rare courses I have such a feeling about at Tsing-Hua University" (F018).

- Thoughts on non-Gestalt content: Any text about thoughts on non-Gestalt course content, teaching materials or teaching methods. Example: "Today the teacher encouraged us to try taking photographs not just at eye level, for fear of losing various angles in looking at the world. ... Photographic creation demands careful consideration, only an unusual camera angle can make a photograph outstanding" (F018).

- Comments on personal progress: Any text containing positive or negative comments on personal progress or performance.

- Teacher approval: Any text responding to the teacher's approval or lack of approval of the student's work or progress.

2. **Photographic technique:** Any text about the development of photographic techniques, or difficulty in acquiring such techniques.

- Technical difficulty: Any text about facing technique problems such as focus, depth of field, exposure or the use of perspective.

- Technical development: Any text demonstrating proficiency in photographic techniques. Example: "Photographing still lifes such as flowers was much easier than animals. The results are also better because I had plenty of time to set the shutter speed and aperture. When taking pictures of, say, a duck, whenever I decided the shutter speed and aperture, the duck had moved away and of course the intended effects couldn't be achieved" (F018).

3. **Image appreciation:** Any text about the ability or lack of the ability to apply Gestalt theory to analyze and appreciate photographs.

- Subjective judgment: Any text about judging the quality of photographs on subjective grounds. Example: "The teacher gave us some pictures by students from last semester, and then asked us to compare the quality of them subjectively. This was something I had not done before. In the past, when looking at photographs, the only thing I cared about was whether 'I like it' or 'I don't like it', details such as subject matter or contrast were often overlooked. After having tried to rank those photographs in order of quality, I found it still difficult to judge photographs subjectively" (M316).

- Difficulty with theory: Any text about experiencing difficulty in understanding Gestalt theory or using Gestalt theory to analyze photographs. Example: "In today's class, teacher Lu talked about Gestalt psychology a few times. Although interesting, it was a bit too difficult to be fully understood. I hope [next time] he can slow down a bit when introducing this topic" (F018; this is a special case, most examples in this category are kind of misunderstanding of Gestalt theory. In other words, students wrote something about Gestalt theory, but they made mistakes).

- Understanding of theory: Any text that shows a clear understanding of Gestalt theory. Example: "Highly interested in the theories of 'field dependent' and 'field

independent'. We always believe that 'being able to examine the tiniest things' [a Chinese idiom] is a sign of great insight. However, it seems that the idea of field dependent [being able to separate parts from a whole] is to some extent contradictory to the idea of being able to perceive parts as a whole"(F018).

4. **Application of theory:** Any text about applying Gestalt theory to produce photographs, or a lack of an acute sense of observation in the production process.

   - Acute sense of observation: Any text about having or not having acute sense of observation. Example: "Teacher Lu praised F115 [a female student] in private for her good intuition of some visual cues. I had a talk with the person next to me and we reached an agreement that both of us lacked that sort of sense. Although perhaps this is a natural talent, I would like to ask for the teacher's advice about how to improve this sort of intuitive sense" (F018).

   - Reflection on applying theory: Any text about reflections on applying Gestalt theory to produce photographs. Example: "Because I did not know much about photography in the past, I was almost carefree when taking pictures. But after taking this course, I became afraid of taking pictures because I was not familiar with those theories. Whenever I took photographs, it [the sense of fear] always made me felt not up to par. It was even more frightening when I had to explain [analyze] my own photographs. Not long afterwards, I adopted *a compromise* which was not to think of those theories at first [just took pictures], and afterwards used them to analyze my photographs" (F018).

5. **Artistic perspective:** Any text about general intention or determination to produce good photographs, or the linkage between Gestalt theories and art.

   - Having an intention: Any text about general intention, determination or effort to produce a good photograph. Example 1: "When taking pictures I had a blind spot, that is, I did not know what I wanted to express in the photographs. Although photography is perhaps not that serious, a demand for expressing something is essential. This could be a kind of beauty, or something that moves the photographer" (F018). Example 2: "On reflection, I realized that I lacked the determination to produce a 'satisfactory' photograph. One classmate went to the same underground station several times only to take pictures of a traffic sign near the exit. Another took pictures of a flattened coke can repetitively in the same road" (F533).

   - Art appreciation: Any text showing an appreciation of art or relating Gestalt theory to art. Example: "... I found that we really lacked the abilities to appreciate art, this was perhaps because our learning habits had been determined by the school's teaching in which the appreciation of art was largely overlooked. Maybe we needed a long period of time to develop the abilities to appreciate art, but novices like us could also use the things we learned in the classroom such as the concepts of 'direction', 'counteraction', 'balance', and 'contrast' [these were the concepts the teacher introduced in a class in which he conducted a detailed analysis of the Cézanne's painting 'Madame Cézanne in a yellow chair' in terms of Gestalt theory] to appreciate the beauty of a painting – this was the best result I obtained from the course" (F018).

Appendix F: Validation form for the analysis report of the learning diary

Code Name: _____ (A code name comprises one letter and three digits. The letter, either M or F, stands for gender — male or female, followed by the last three digits of your student ID number).

Each participant receives an analysis report and this validation form. In this form, there are a total of 6 questions: the first 5 questions ask about the accuracy of the analysis account relating to each of the 5 major themes in the report, and the final one asks about the credibility of the report as a whole. Your responses to the accounts can be of much help in validating them. Moreover, you can show the teacher where his explanations and analyses are partial or incorrect, and need to be further revised. Please remember that the teacher is asking you to recall your response to the course last June (2006), and not what you think at the moment. Now, read through the report carefully, and answer the following questions:

Question 1: General response to the course[1]

This theme is used to synthesize the students' thoughts on *Image Aesthetics* in terms of course activities, non-Gestalt course content (e.g. photographic skills and teaching methods), character of the teacher, teacher approval and comments on personal progress.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

[1] Each question is linked to a major theme in the coding system (see table 6.1).

Question 2: Photographic technique

Findings from the diary analysis reveal that there were two phases in the writers' experience of learning photographic techniques. The first was an experimental phase in which learners had difficulty in obtaining perfect exposures and expressing intention in photographs because they were not familiar with certain necessary techniques. The second was a developmental phase in which, after continual practice, the learners were able to overcome the problems that had emerged in the previous phase. With regard to the whole learning process, the two phases repeated an experiment-and-development cycle, but there was no clear boundary between them.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

Question 3: Image appreciation

For the majority of the students, learning how to use Gestalt concepts to interpret photographs objectively was a brand-new experience. Since we "must try not to be influenced by our subjectivity so that we can look at photographs objectively" (F533, Week 3), this approach left some students with "lingering doubts" until the final phase of the semester (F214, Week 3). Given the fact that Gestalt theory cuts across the fields of psychology and physics, more than half of the learners (11/21) at times experienced difficulty either understanding the theory or applying the theory to analyze their own work. Nevertheless, most of the diarists (15/21) eventually developed a clear understanding of the theoretical content, and were able to provide concrete examples to demonstrate this understanding.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

Question 4: Application of theory

An acute sense of observation is a prerequisite for photographers to find appropriate subjects. A few students (2/21) perceived it as a natural talent, which would enable them to seize perfect opportunities for combining photographs with theories. But for many learners (7/21), the integration of Gestalt theory and their work was quite difficult and to a certain extent impractical.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

Question 5: Application of theory

Taking photographs without clear intent was a problem common to many novice photographers. Intention, in the students' words, could mean either the desire to show certain effects in their photographs or the determination to devote more effort to the pursuit of beauty. Pursuit of beauty is a characteristic that photography has in common with numerous art forms. A few participants (3/21) attempted to apply Gestalt theory to the appreciation of painting and music, or questioned the appropriateness of doing so.

Does this part of the analysis reflect your learning experiences? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

Question 6:

Is the analysis report as a whole accurate and credible from your point of view? If the second or the third box is ticked, please explain briefly why and provide actual example(s) in the space provided.

☐ Agree ☐ Agree with exceptions ☐ Disagree

Appendix G: The abridged learning diary of F018

- Week 2

今天老師對於光圈快門的掌握有近一步的解說，藉由示範照片我能夠進一步的瞭解其效果。高中的時候熱愛攝影的物理老師曾經花兩節課的時間解說照相機簡易的光學原理並示範他的照片，和今天在影像美學課學到的東西互相闡釋，讓我瞭解更多 (F018, Week 2)。

The teacher gave a further explanation on the control of aperture and shutter speed. Through the demonstration of pictures, I was able to understand its potential effects. When I was in high school, my physics teacher, a keen photographer, once spent two lessons introducing the optical principles of a camera and demonstrating his own pictures. The knowledge I acquired from those two lessons corresponds to that of today's class which has furthered my understanding of [the concepts and principles] of photography (F018, Week 2).

- Week 4

"拍小東西，如小花小草等等，因為擁有相對充足的時間可以調整光圈快門，所以效果普遍比動物要好，拍鴨子時光圈快門調整好後鴨子也改變了位置而達不到原先預期的效果" (F018, Week 4)。

Photographing still lifes such as flowers was much easier than animals. The results are also better because I had plenty of time to set the shutter speed and aperture. When taking pictures of, say, a duck, whenever I decided the shutter speed and aperture, the duck had moved away and of course the intended effects couldn't be achieved (F018, Week 4).

"回家檢視今天的成果，發現可以用的照片還真少，有些在拍攝時以為曝光量足夠了，可是用電腦看才發現圖的色彩不夠鮮豔，很明顯是曝光度不足的問題" (F018, Week 4)。

When reviewing the pictures I took today, there were only a few that are of good quality. The colours of some photographs are not bright enough on the computer screen, although I thought the exposures were acceptable when taking those pictures. This is obvious a problem of under-exposure (F018, Week 4).

- Week 5

"我想到自己外拍時的盲點，那就是我並不清楚自己想要表達些什麼東西，攝影本身或許沒有那麼嚴肅，可是應該有一個訴求作為基本，這個訴求可以是美，可以是一個感動到攝影者的畫面..." (F018, Week 5)

I had a blind spot while taking pictures, that is, I often didn't know what I wanted to express in the photographs. Although the art of producing photographs is perhaps not that serious, a demand for expressing something [in a picture] is essential. This demand could be the pursuit of beauty or something that moves the photographer (F018, Week 5).

- Week 6

今天上課內容談到柴嘉妮效應，也就是所謂封閉性法則的變形。他指出我們對於未完成的任務會有較好的記憶力，從另一個角度來說，畫面影像的"缺憾"，或是新奇的變化可以讓觀者用自己的角度去參與填補，而在我們的記憶中擁有不斷被思考回憶的空間。這是個看似很簡單的道理，我們也可以利用這個原理使照片有更豐富的變化 (F018, Week 6)。

Today the teacher talked about the concepts of Zeigarnik effect, which is a variant of the Gestalt principle of closure. He pointed out that we tend to retain unaccomplished tasks in our mind. On the other hand, a gap or an unexpected situation [a visual riddle] in a picture may invite the viewers to resolve the issue based on their own experience. This unsolved riddle remains in our memory and is recalled and thought about until it is solved [and a closure is formed]. This seemingly simple concept could be used to make our pictures more vivid and diverse (F018, Week 6).

- Week 8

"在準備照片的期間，發現了比以前進步的地方，那就是在拍照前能多想一想自己想要呈現些什麼東西，然後依照這個意圖多加嘗試，拍出來的照片似乎比第一次外拍進步了一些" (F018, Week 8)。

When preparing the pictures for my midterm presentation, I noticed my improvement. That is, I tended to think more carefully about what I wanted to show in a picture before making the first shot. The photos I took now seem to be a bit better than those in my first coursework (F018, Week 8).

- Week 9

"報告完感覺很糟糕 已經開學那麼久，可是還是不能掌握住曝光量 曝光過度，亦或是曝光不足，都不該在這時候還犯這樣的錯誤" (F018, Week 9)。

I feel terrible after my presentation. I still cannot fully master exposure after all this time. I should not be making mistakes such as over-exposure or under-exposure by now (F018, Week 9).

- Week 10

藉著掃攝可以將慢速移動的物體表現出高速的效果，另一方面，卻又可以用超短時間的快門來捕捉高速移動物體的動感，如靜止在空中的雨點—因為我們知道雨點是快速落下的，所以雨滴凝結於空中的瞬間反而有速度的力量蘊含其中，我覺得這是攝影很有趣也很吸引人的地方 (Week 10)。

Through panning we are able to create the sense of high speed for slow moving objects. On the other hand, we can also freeze the motion of fast moving objects such as rain drops in the air with a very fast shutter speed. We all know that the rain drops fall down quickly so that they are filled with the momentum of velocity [as a result of the force gravity]. [Being able to transform such an atmosphere into a picture,] this is what I found photography interesting and attractive.

- Week 12

我們已經很習慣使用的黃金分割點原來也是來自于這個原理。在黃金分割點的位置上，視覺元素受到被角落以及中心拉鋸的力量，達到動態平衡的感覺。而放置於正中心的視覺元素受到四面八方的視覺力，但彼此互相抵抗平衡，所以只有中心的視覺力緊緊吸住了視覺元素，這是一種最穩定的平衡方式，但也因此失去了觀者參與的機會。由此我們可以瞭解老師一再強調的，置中並不是不可以，而是要搭配想要傳達的意圖來使用 (F018, Week 12).

The rule of thirds that we are accustomed to also derives from this principle. In one of the points of the rule of thirds, a sense of dynamic equilibrium is achieved because of the equal pulls from the centre and the corner. On the other hand, at the centre of a frame, visual forces from all directions balance one another, and therefore the central position makes for rest. Although the centre is the most stable position [in a picture frame], we as viewers lose the chance to participate actively in the process of visual balance. Hence, we can now understand why the teacher keeps reminding us that central positioning is not unacceptable, bearing in mind that it has to be used with a clear intention (F018, Week 12).

- Week 13

今天老師發的講義有以力矩(torque)來解說視覺力平衡的觀念，老師說雖然這樣不是很好，畢竟物理場和心理場並不相同，不過我覺得對我們的幫助理解很大。當然還是有不一樣的地方。例如我們把單一個元素放在黃金分割點，在視覺力來說中心和邊角的拉鋸可以達到動態的平衡，不過就力矩來說，支點在中心的話，只要不是放置在中心就不能達到平衡，但大致上對於兩個視覺元素的靜態與動態平衡來說，都能幫助我們理解 (F018, Week 13)。

In today's handouts, the teacher explained the concept of visual balance using the idea of torque. According to the teacher, it is not entirely appropriate to do so as physics is different from psychology. However, I have found this explanation very helpful. One of the differences between these two fields is that if we place an object at one of the points of the rule of thirds, a sense of dynamic balance would be achieved because of the equal visual forces from the centre and the corner. Whereas in the notion of torque, if the pivot is in the centre [of a frame], balance cannot be achieved if the object is not centrally placed. Nonetheless, this explanation helps us to understand the concepts of both static and dynamic equilibrium in a general sense (F018, Week 13).

- Week 14

"或許真的要欣賞這些作品[如印象派畫作]是需要長期培養藝術賞析的能力，不過入門如我們也可以藉由上面提到的，方向、中和、伸展、平衡、對比等等方式慢慢去體會其中的美，這是在這堂課我得到最大的收穫" (F018, Week 14)

Perhaps we need a long period of time to develop the ability to appreciate these artworks [she was talking about the paintings in the National Gallery in London], but novices like us could also use things we learned in today's class such as the concepts of 'direction [of visual forces]', 'counteraction', 'balance', and 'contrast' [these were the concepts the teacher introduced in a class in which he conducted a detailed analysis of the Cézanne's painting 'Madame Cézanne in a yellow chair' in terms of Gestalt theory] to appreciate the beauty of the artworks. I feel this is the most rewarding part of this course (F018, Week 14).

- Week 15

"一定要持續的，大量的練習，才能一直有好的作品產生" (F018, Week 15)

Continual, substantial practice will result in the creation of good work (F018, Week 15).

- Week 16

"因為以前什麼都不懂，拍攝時心無罣礙所以沒有拘束，可是修了課後拍攝時因為對那些理論不熟悉而害怕，反而縛肘拑腳怎麼拍都不對勁，更害怕的是要怎麼解釋自己的作品。 後來折衷的辦法是 - 有了作品再想怎麼用這些理論解釋" (F018, Week 16)

Because I did not know much about photography in the past, I was almost carefree when taking pictures. But after taking this course, I became afraid of taking pictures because I was not familiar with those theories. Whenever I took photographs, it [the sense of fear] always made me feel not up to par. It was even more frightening when I had to analyze my own photographs. Not long afterwards, I adopted *a compromise* which was not to think of those theories at first [just took pictures], and afterwards use them to analyze my photographs (F018, Week 16).

"我很喜歡這堂課程的氣氛，除了老師對課堂的認真態度還有幽默風趣之外，很少有老師這麼關心課堂上的每一位同學，不放棄任何一個人，老師對同學的關心真是我在清大很少感受到的。 課後時間老師也不吝于提供輔導，提供了大家很多討論練習的機會，因為老師的堅持使我感到很有收穫，非常感謝老師" (F018, Week 16)

I really enjoyed the atmosphere of this course. The teacher was earnest in his work and humorous in every sense. I rarely see a teacher who cares so much about each student and never gives up on anyone. This is one of the rare courses I have such a feeling about at Tsing-Hua University. The teacher was always available for personal consultation after the class and offered us many opportunities for discussion and practice. I believe this is a very rewarding course because of the teacher's persistence and I am truly grateful for it (F018, Week 16).