THE DEVELOPMENT OF TRAINING COURSE BASED ON NONDIRECTIVE TEACHING THEORY TO IMPROVE VISUAL COMMUNICATION DESIGN ABILITY OF UNDERGRADUATE STUDENTS

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ABSTRACT

The purposes of this research were 1) To develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students and 2) To compare students' visual communication design ability before and after training course based on nondirective teaching theory. The sample group were 38 fourth-year students in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023. Through cluster random sampling. The research instruments involved 1) Activity plan according to the nondirective teaching theory and 2) Visual communication design ability test (multiple-choice test and performance test). Data were statistically analyzed by mean, standard deviation, and t-test for dependent samples.

The findings were revealed that

1) The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students has synthesized into 5 steps: 1) Study stage, 2) Discussion stage, 3) Thinking stage, 4) Planning creation stage, and 5) Summary analysis stage, as well as taking used to develop an activity plan according to the nondirective teaching theory. The results are shown the quality of the activity plan by experts overall, the suitability of the research objectives has the most suitable.

2) The visual communication design ability of fourth-year students from Qingdao University after the experiment was higher than that before the experiment at significance level .01.

Keywords: Visual communication design ability, Nondirective teaching theory, Undergraduate students

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Chapter 1
Introduction

Rationale

Visual communication design is a discipline that reflects the social development situation and constantly leads the social lifestyle, and also constantly innovates, keeps up with the trend of the times, advocates innovation and vitality, and is closely related to social life. With the development of society, China's college education construction is changing from infrastructure construction to connotation construction and characteristic construction. From the current development point of view, the development of visual communication design education in the country is constantly expanding, and the society's demand for talents is also increasing, and it is urgent to solve the existing main contradictions in talent training. (Chen Wenjie, 2014, p.12). Visual education in the most intuitive way to hands-on education can help students improve their practical ability to better understand their own development direction. However, the traditional visual communication design teaching concepts, content, methods, models and methods are still following the existing routines in the past, breaking away from the existing social reality, and failing to provide timely and effective professional guidance to students. For a long time in the past, visual communication design has borrowed from foreign teaching theory systems, it cannot proceed in China’s conditions well. (Li Jing, 2017, p.3). At present, most of the visual communication education in China's colleges and universities follows the old-fashioned teaching mode of traditional art education or arts and crafts education, and the visual communication design curriculum system of some colleges and universities deviates from the market, and is not perfect, systematic, and distinctive in the construction of educational theory system. Teachers still mechanically teach students some traditional knowledge in textbooks in the classroom, and students' thinking cannot be diverged, and they can only be confined to the thinking modules created by teachers for students. The college teachers are still limited to traditional teaching thinking and mode, and have little understanding of some new media and new knowledge in visual communication design, and cannot truly adapt to the needs of the current society. Secondly, students do not really understand the connotation of visual communication design, and the degree of commercialization in teaching is too serious. (Li Jing, 2017, p.3). The purpose of teaching Visual Communication Design is to cultivate students’ creative thinking and innovative concepts; It is also a more

practice-oriented discipline. However, at present, the teaching of visual communication design is more focused on theoretical teaching, which makes students passively accept various theoretical knowledge in the classroom, and lacks the process of independent thinking and self-practice. At present, the teacher-centered classroom is no longer suitable for college education, and this teaching model not only does not get students to be qualitatively improved, but the whole classroom is also boring and lifeless. Teachers do not have enough understanding of the thinking guidance and self-construction of students majoring in visual communication design, which is not enough to support them to learn and give full play to their professional skills. (Zhang Xiaorong, 2018, p.7). The educational and teaching achievements of visual communication design major are inseparable from teachers teaching innovation mode, pioneering thinking and students' consciousness of independent research and creative creation. At present, in view of the interference of traditional education and teaching concepts and professional title evaluation and other factors, the phenomenon of teachers emphasizing academics and neglecting teaching has also appeared; students neglect the improvement of technical skills, are eager for utilitarianism, and are forced to achieve success, and there are also situations where nothing can be achieved. These situations or phenomena have restricted the education, teaching and role of visual communication design.

Using nondirective teaching theories can optimize the concept of curriculum education, and no longer limit teaching to the teacher himself and boring knowledge; Students can discover their own strengths and weaknesses in the classroom, and discover their own shortcomings; At the same time, you can also speak freely, express your true thoughts, and stimulate your interest in design, rather than blindly designing for design; The teacher's role in the classroom is that of a facilitator rather than a leader. Wang Xin (2017, p.7) summarizes in that. Learning, teachers are merely advisors, participating in discussions at the request of students, rather than instructing or nondirective. The visual communication design major should break the previous closed teaching, extend the classroom from time and space, and create a free learning environment for students. Teachers can not only choose the teaching space according to the teaching content, but also change the rigid teaching methods in the past, guide students to change from passive learning to active learning, and then stimulate their creative thinking, further cultivate students' communication ability and independent learning ability, and enhance students' ability to analyze and solve problems. Nondirective teaching theory emphasizes respecting students' individuality, fully mobilizing students' enthusiasm, giving full play to students' potential, and

enabling them to enjoy the happiness of realizing their own value in active participation; Emphasizing the importance of the emotional and interpersonal relationship between teachers and students, it advocates striving to form a classroom psychological atmosphere with the characteristics of truthfulness, acceptance and understanding, so that students can "express themselves freely and participate freely" in this atmosphere, which has a positive role in promoting teaching reform. Many of the ideas advocated have taken root and have become some of the mainstream ideas in the field of education in the world, such as the emphasis on respect for students: the recognition that each student is a unique individual that must be respected; Emphasis on developing students' positive self-awareness and self-concept; Emphasize student participation in the decision-making process of education and allow students more freedom to learn independently. These ideas have become universally accepted principles, shadow resounding today's school education practice.

It is a well-known and accepted fact that to be successful in any field, continuous learning and training are required. However, many people are hesitant to take training courses because they think it will be too time-consuming or expensive. Others may not see the value in taking a course, compared to learning on the job or through traditional methods. In reality, there are many benefits of taking training courses that can outweigh the costs and time commitment, and ultimately help you reach your goals faster. (Elizabeth Stanley, 2022, p.21). Training of students are absolutely essential in this changing environment. Training gives a lot of benefits to the students such as improvement in efficiency and effectiveness, development of self-confidence and assists everyone in self-management. The stability and progress of the organization always depends on the training imparted to the students. Training becomes mandatory under each and every step of expansion and diversification. Only training can improve the quality and reduce the wastage to the minimum. Training and development are also very essential to adapt according to changing environment. According to Garry Kasparov (2015, p.9), “Training course is the process of teaching new students the basic skills they need to perform their jobs; Training course is the process of transmitting and receiving information related to problem-solving.” Training course simply provides the students’ ability to perform a specific job. Thus, the art, knowledge, and skill to accomplish a specific job in a specific way are called training. As Peter Taylor (2003, pp.41-43) said about training courses: It is an important part of various development projects. Good training helps participants gain

new knowledge and skills, and the attitude that will help them put these things into practice to change their situation.

In summary, the traditional visual communication design classroom needs to be innovated to strengthen students' practical ability and achieve the purpose of students guiding the classroom. At the same time, nondirective teaching theory in training course is suitable for all stages of current visual communication design teaching, which not only enables students to become the leader of the classroom, learn to learn actively, stimulate their inner interest in learning, but also improve their visual communication design ability and independent thinking ability. It can be seen that this teaching method is positive and effective. Therefore, researchers are interested in improving students' visual communication design ability through nondirective teaching methods, thereby improving students' interest and achievement.

Objectives

1. To develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students.
2. To compare students' visual communication design ability between before and after training course based on nondirective teaching theory.

Research Hypothesis

After the training course based on nondirective teaching theory, the students have improved visual communication design ability obviously.

Scope of the Research

Population and the Sample Group

Population

There were 912 fourth-year students from 24 classes in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023 (There was student's mixed ability, High level, medium level and low-level abilities.)

The Sample Group

There were 38 fourth-year students in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023. Through cluster random sampling.

The Variable

Independent Variable: Training course based on nondirective teaching theory.

Dependent Variable: Visual communication design ability.

Contents

This research presents the development of nondirective teaching theory to improve visual communication design ability of undergraduate students. The curriculum consists of 3 learning units in the visual communication design ability course. Mainly applies to design software: 1) poster design, 2) sign design, and 3) product design.

Time

The study period is from April to October 2023 is divided into the following phases:

1. Develop proposal research in April 2023.

2. Modified and completed 1) the activity plan of visual communication design training course based on nondirective teaching theory and 2) the visual communication design ability test based on nondirective teaching theory in June 2023.

3. Try out the activity plan and research instrument in July 2023.

4. Experimental studies with sample group in the second semester of the academic year in July 2023 total for 15 hours:

Activity plan	Hour	Date
1. poster design	5 hours	2023.07.04
2. sign design	5 hours	2023.07.06
3. product design	5 hours	2023.07.07

5. Summarize the research and complete the research paper from August to September, which published in October 2023.

Advantages

1. Student level

1.1 The nondirective teaching theory of visual communication education can cultivate students' ability of independent learning and innovation.

1.2 The nondirective teaching theory can improve students' enthusiasm for the classroom and enhance students' eager pursuit of new things.

2. Teacher level

2.1 The nondirective teaching theory can improve the full mobilization of teachers, frees their hands and innovates new teaching method in teacher career.

2.2 The nondirective teaching theory can help teachers improve the quality of teaching in other subjects.

Definition of Terms

Training course based on nondirective teaching theory

Training course based on nondirective teaching theory is mean: The training course is mainly based on training and the trainees can master a certain skill through training, observation, etc. The training is primarily skills-based, with a focus on behavioral practice. To achieve unified scientific and technological specifications and standardized learning, through modern information processes such as goal planning and setting, knowledge and information transmission, skill proficiency exercises, homework, and achievement evaluation. Trainees can achieve the expected level of improvement goals, improve personal ability and work ability through certain means. Training course based on nondirective teaching theory is to promote students' self-realization. That is to help students achieve greater personal integration, effectiveness and realistic self-identification. In this research the teaching process of the nondirective teaching theory consists of five steps, researcher has synthesized from many researchers.

Step 1 Study, teachers as the leaders of the classroom, teach students the basics of designing lessons and help students have a better understanding.

Step 2 Discussion, students give their own judgments on a series of questions such as "why this style appears" and "how to choose a design style that suits you", students express their own views and opinions on some excellent cases, and explain the knowledge learned in the teaching of basic knowledge and can be applied to their own design concepts.

Step 3 Thinking, students should summarize the conclusions reached in the discussion stage, have a preliminary plan for their next design works, think about how to determine how to suit their own design theme and style, what design means to use, determine what kind of design theme is in line with the current situation, and choose what they are good at or like in the choice of design tools.

Step 4 Planning creation, students need to clarify the audience and design environment of the creative theme. Next, students can create themes according to the advantages and disadvantages of excellent cases learned in basic learning.

Step 5 Summary analysis, students explain their design concepts and design processes and the troubles encountered in the design process. The teacher compared and analyzed the students' previous design work and summarized the inadequacy.

Visual communication design ability

Visual communication design ability is an active act of communicating a particular thing through visual forms that is expressed and conveyed to the audience through visual media, reflecting the characteristics of the times and rich connotation of design, and its field is constantly expanding with the progress of

science and technology, Most or part of it relies on vision, and is represented in the image of two-dimensional spaces such as logos, typesetting, painting, graphic design, illustration, color and electronic equipment. The process of conveying some specific information to the communicated object through a visual art form with a certain purpose as the precursor, and influencing the conveyed object. The so-called "visual symbols", refers to the eyes can see the symbols that can express the certain nature about poster, sign and various design products.

Research Framework

The researcher has studied the documents and research related to nondirective teaching theory from many researchers: Rogers (1969); Maryam Hasan (2013); Lu Mingjuan (2019); Guan Xin (2020). In this research, researcher has synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students and defined as a framework for research concepts as follows:

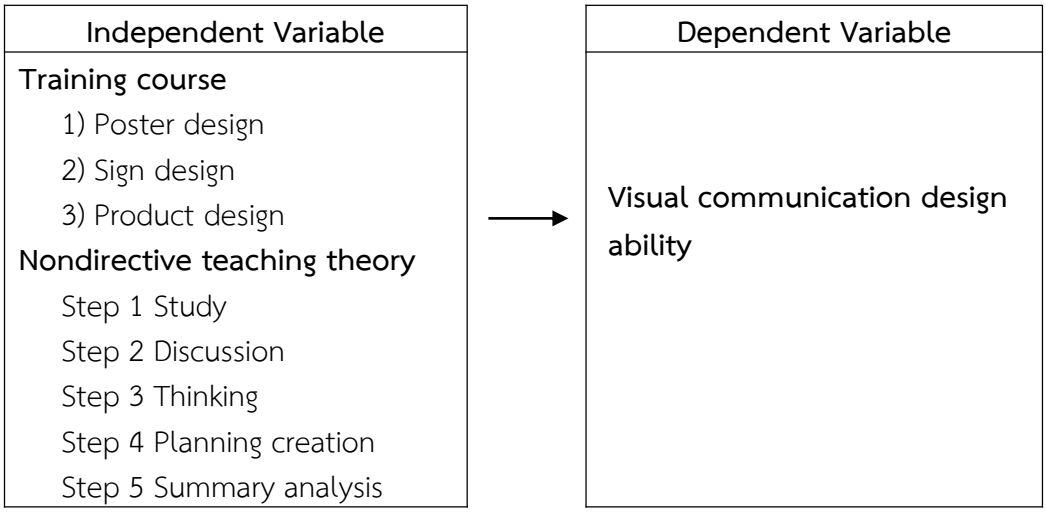

Figure 1.1 Research Framework

Chapter 2
Literature Review

The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students. The following literature were studied. This researcher has proposed theories and related research as follows:

1. Nondirective teaching theory
2. Training course
3. Visual communication design ability
4. Measurement and Evaluation of the visual communication design
5. Related research

The details are as follows:

Nondirective teaching theory

Nondirective teaching theory, also known as humanistic teaching theory, it is a teaching theory that arose in the United States in the 1960s, and its representative figure is the American humanistic psychologist, Rogers. In 2014, the theoretical knowledge involved in the teaching model was re-summarized and updated. "Nondirective teaching theory" emphasizes that everyone has the motivation to learn and can determine their own learning needs; teaching must be student-centered; teachers are the facilitators who help students explore life; and the ultimate goal of teaching is to promote the development of students' personality. "Nondirective teaching theory" not only had an impact on the educational practice and educational theory in the United States, but also played a positive role in promoting the development of education in other countries, including China.

1. Meaning of nondirective teaching theory

Nondirective teaching theory emphasizes respecting students' individuality, fully mobilizing students' enthusiasm, giving full play to students' potential, and enabling them to enjoy the happiness of realizing their own value in active participation; Emphasizing the importance of the emotional and interpersonal relationship between teachers and students, it advocates striving to form a classroom psychological atmosphere with the characteristics of truthfulness, acceptance and understanding, so that students can "express themselves freely and participate freely" in this atmosphere, which has a positive role in promoting teaching reform.

Zhang Xiaoying (2006, pp.67-68) The core of Rogers' theory of "nondirective teaching" is people-oriented, focusing on people in the teaching process, that is, respecting people, understanding people, and caring for people; Focus on human development, that is, emphasize human value and develop human potential; Classroom teaching does not stop at the level of memorizing knowledge, but promotes constructive changes in personality through the transmission of knowledge; Focusing on interpersonal relationships, in addition to harmonious teacher-student relations, it also requires a good educational atmosphere, so that students take the initiative to learn happily, always full of self-confidence and a sense of success, and constantly emerge new ideas and creativity, which are undoubtedly of positive significance, and have practical guiding significance for the basic education curriculum reform implemented in China at this stage, especially for the concept and strategy of basic education reform at this stage that emphasizes the comprehensive and harmonious development of people.

Gu Zhiyun (2009, pp.76-78) Rogers' humanistic-centered nondirective educational philosophy pays full attention to students, to the growth of students as a whole personality, to students' meaningful learning and learning to learn, and to teachers as facilitators of learning. China's traditional classroom teaching mainly focuses on the transmission of knowledge, and students can only passively accept and obey, and express it when necessary. Therefore, Rogers' educational ideas are of reference to today's classroom teaching in China. It helps classroom teaching to shift from "knowledge-centered" to "people-centered", and from teachers to "teach knowledge" to "teach people to learn knowledge". Therefore, the addition of the teaching goal of "process and method" to China's new curriculum reform is a positive reflection of it. In the learning process, we pay attention to cultivating students' cognitive methods, exploration interests and habits, and sound personality, so that they can gradually learn to learn, learn to develop actively, and learn to develop comprehensively, which is the fundamental transcendence of "mechanical learning".

Cheng rongwang (2011, pp.125-126) Rogers' idea of "nondirective teaching" fully affirms the main position of the educated, puts learners in the central position of education, pays attention to the true feelings of the educated, requires students to assume learning responsibilities, selects learning content according to their own interests, and believes that teachers are only the promoters of teaching and the learning of students facilitate rather than interfere and exercise too much control. At the same time, the idea of "nondirective teaching" has promoted today's educational reform. At present, China's education circles are shouting that "education reform is

imperative", but how to change it is still unknown. Rogers' "nondirective teaching" just provides some reference for China's educational reform, we must change the traditional teacher-centered view, advocate people-oriented, "student-centered", attach importance to human values, especially pay attention to students' experience in the learning process, pay attention to cultivate students' independence and creativity. In terms of teachers, teachers are required to show their true selves, pay unconditional attention to students, cherish, accept and respect students, and become facilitators of student learning. Rogers also emphasized the importance of the process of learning and the use of learning methods, which is undoubtedly very good for today's education of revelation.

Wang Jianhua (2012, pp.50-52) Rogers believes that under the guidance of nondirective teaching theory, each student can learn well in his or her own way, and advocates that teaching activities are student-centered, and strive to promote students' independent learning and self-realization, which helps cultivate students' independence, autonomy and creativity. Attach importance to emotional investment and the establishment of good interpersonal relationships in the teaching process, so that students can be placed in a situation of care, understanding and trust, and learn happily physically and mentally. Focusing on human potential and personality development, emphasis is placed on allowing students to develop their own study plans and choose learning directions and procedures according to their own interests, so as to cultivate their sense of freedom and responsibility, as well as the ability to "self-actualize".

Ding Shuping (2013, pp.12-14) In the context of meaningful learning, the educational concept of nondirective teaching has important theoretical and practical significance for us to reflect on the current education system. Promoting the transformation of the role of teachers, stimulating students' motivation for independent learning are all things that we should cultivate in the research process. Attach importance to students' independent exploration and let students learn to learn. Student’s value independent inquiry and emphasize meaningful, important, and hands-on experience meaningful experiential learning. Focus on the learning process so that students can master the scientific method of independent learning and learn to learn. However, if we want to achieve more long-term development in education, we still need educators and researchers to constantly strive to explore and improve.

Summary of the meaning of nondirective teaching theory: Many of the ideas advocated by Rogers have taken root and have become some of the mainstream ideas in the field of education in the world, such as the emphasis on

respect for students: the recognition that each student is a unique individual that must be respected; Emphasis on developing students' positive self-awareness and self-concept; Emphasize student participation in the decision-making process of education and allow students more freedom to learn independently; Emphasize the importance of learning to learn and the need for teachers to be facilitators of learning, among others. These ideas have become universally accepted principles, shadow resounding today's school education practice.

2. Importance of nondirective teaching theory

Fully affirm the student's subject status. It has positive significance for mobilizing students' enthusiasm for learning and giving full play to their creativity; unique insights into the unity of knowledge. Rogers' exploration of the conditions that affect the performance of students' potential and his assertion that interpersonal relationships and emotional attitudes are the main conditions that affect the performance of potential are an important aspect that behaviorism and cognitive schools ignore.

Rogers (1969, p.162) Humanistic psychologists believe that true learning involves the whole person, not just providing facts to the learner. A true learning experience enables the learner to discover his own unique qualities and discover his own characteristics as a person. The essence of teaching is to promote students to become perfect people. The nondirective teaching of the American humanist psychologist Rogers is representative of this genre. The goal of teaching is to cultivate people into "fully functioning people, self-developing people, and self-actualized people. "Rogers believes that teachers play the role of facilitators in the teaching process. Teachers promote student growth by building rapport with their students. This teaching process aims to solve students' emotional problems and usually includes the following five stages:

1. Identify the situation of help, teachers should encourage students to express their feelings freely. Only by expressing their own ideas, teachers can understand what students think in their hearts, not only can students lead the classroom, but also give students their own digestion and practice time, through the communication between teachers and students and between students, so that students have been trained, but also more conducive to the cultivation of students' self-confidence, so that students are more impressed by the course, so as to achieve the purpose of teaching.

2. Exploring problems, encourage students to define problems by themselves, teachers should accept students' feelings and clarify them when

necessary. When students learn concepts and principals, teachers give them some examples and problems, so that students can actively explore through reading, observation, experimentation, thinking, discussion, listening and other ways, and discover and master the corresponding principles and conclusions by themselves. With students as the main body, let students consciously and actively explore, master the methods and steps of understanding and solving problems, study the attributes of objective things, discover the causes of the development of things and the internal connections of things, find out the laws from them, form concepts, and establish their own cognitive models and learning method frameworks.

3. Forming insights, let students discuss problems, express their opinions freely, and teachers provide help to students. Teachers, as "directors", guide and inspire students' thinking, and students carry out conscious thinking exploration activities under the guidance of teachers. Students' learning is always in a positive state of "question-think-explore-solve", students find problems through discussion, ask questions and try to solve problems, and teachers give corresponding help through students' discussion results. Students look at problems differently, will reveal the connotation of basic concepts and the essence of basic laws from all angles and aspects, if these different views and views are discussed, it will form a strong external stimulus, arouse students' high interest and attention, thus producing autonomous exploration and collaborative learning.

4. Planning and decision-making, students plan preliminary decisions, and teachers help students clarify these decisions. The conclusions drawn during the discussion phase can be used as a lesson plan for students in class. Students should plan their own route according to the content of this lesson and the results of the discussion, and carry out their own course content through a complete lesson plan, such as determining their own design style and implementing it in the design classroom. Finally, teachers help students evaluate and improve lesson plans.

5. Integration, students gain deeper insights and take more positive actions, and teachers should support this. In the classroom integration, students should be guided to summarize new knowledge, and promote the transition of students' understanding from the level of concrete experience to the level of abstract generalization. It is necessary not only to pay attention to the integration of conclusions, but also to review the learning process of knowledge. In this way, the knowledge can be constructed in an orderly manner, the applicable context of knowledge and its ins and outs can be clarified, and the knowledge can be transferred quickly and smoothly. In addition, according to the examination of the

exercise, grasp the common problems, and summarize and integrate the knowledge content, problem strategies, and thinking methods in a targeted manner.

Rogers divides learning into meaningless learning and meaningless learning according to a certain continuity of meaning. Meaningless learning is only related to the mind, it is learning that occurs "above the neck" with no emotional or personal meaningful involvement. Meaning learning is not a learning that involves only the accumulation of facts, but a learning that brings about significant changes in an individual's behavior, attitude, personality, and future choices of behavior. This kind of meaningful learning is actually a kind of nondirective learning. Teachers become facilitators of the teaching process, and teachers should think from the student's point of view, rather than using the teacher's subjective assumptions and standards to look at students.

Maryam Hasan (2013, pp.41-43) Nondirective teaching model is made based on the work of Carl Rogers and some of the other advocates of nondirective counseling. Rogers gave his ideas on therapy as a way of learning to education. According to Rogers, the nondirective interview has a sequence divided into five phases of activity:

1. Phase I Defining the helping situation, teachers guide students into the course to better attract students' attention to learning and stimulate their interest in learning. Learning objectives can be expressed using explicit action verbs, the expression should be clear, specific, clear, practical, with clear guidance and motivation, so that students can clarify the course objectives, teachers can use students' learning objectives to formulate how to help students complete the learning of this lesson. At the same time, the way of presenting objectives should be flexible and natural, and teachers should guide students to identify learning objectives in a flexible and flexible way. This link arouses students' strong desire to learn through goal orientation, and understands what to learn in this lesson, how to learn, and what kind of learning effect to achieve.

2. Phase II Exploring the problem, teachers give the initiative of learning to students, and give students enough time for students to learn independently by reading books, making annotations, checking materials, thinking, etc. Teachers should fully consider the difficulties that students may encounter in self-study, fully consider how to guide students to self-study scientifically and efficiently and design a scientific and practical self-study syllabus to guide students' self-study on this basis. Before students learn by themselves, teachers first preset some thinking questions, let students learn by themselves with questions, and teachers must effectively guide

the learning method. Teachers comprehensively grasp the students' self-learning situation, sort out the problems encountered by the whole class in self-study, summarize the common problems, and randomly prepare lessons. In this link of learning, teachers should give full play to the role of organization and guidance and give full play to the role of group cooperative learning. Teachers should integrate the information exchanged by students after self-study and clarify the content of the precise lecture.

3. Phase III Developing insights, give full play to the subjective status of students and guide each student to actively participate in teaching activities. Based on independent learning, students conduct group study and discussion on difficult or valuable problems, so as to fully realize the subjective status of students. The teachers will explain the problems that the students cannot solve, and finally achieve the purpose of dispelling doubts. Through this link, break through the key points and difficulties. In the process of cooperative inquiry, the human-centered thinking is fully embodied, and students are in dynamic inquiry learning from beginning to end, and their autonomy is fully reflected. During the activities, students can learn to interact, learn to participate, learn to listen, and learn to respect others. At the same time, teachers are also collaborators, can participate in students' group activities, timely guidance to students, timely guidance, of course, can also communicate and dialogue on an equal footing.

4. Phase IV Planning and decision making, systematic compliance testing of students can test students' learning outcomes. Teachers should design test questions in accordance with teaching objectives. The test questions should be carefully designed in combination with the characteristics of the discipline, the topics should be refined, the quantity should be small, and the quality should be high. Students who meet the test questions are completed independently within a limited time. Clarify the correct answer, timely evaluation and feedback correction. Teachers' feedback and correction should be carried out throughout, paying special attention to students with learning difficulties, and strengthening guidance for students with learning difficulties.

5. Phase V Integration, the integration phase is a summary of the learning situation of the whole class in the lesson, which allows students to summarize themselves or teachers and students together. The content of the summary includes: what you have learned in this lesson, whether you have learned it, and reflect on how your self-learning ability has improved. Through the summary, students review what they have learned in this lesson, incorporate the knowledge

they have learned into the existing knowledge system, and further build a knowledge network; Review what problem-solving methods you have mastered and incorporate them into your existing competency system. Reflect on your own self-learning process, experience the joy of self-learning success, and enhance your confidence and ability in self-learning.

The application of nondirective interview are as under: To solve personal, social and academic problems, to explore feelings of the students, to develop good relationships with others, to make the integration of several events of interview, to investigate the problems of the students, to diagnose the specific feelings of the students, to make emphasis on personal content rather than external, to utilize personal experiences of the teacher and the students, to develop communication skills of the students, to perceive as the students perceives.

Lu Mingjuan (2019, p.90) The theory of "nondirective teaching" emphasizes that everyone has a natural tendency to healthy development, and that interpersonal relationships full of sincerity, trust and understanding will contribute to the stimulation of students' potential. In curriculum teaching, teachers should build a good and harmonious teacher-student relationship, which is an inherent requirement for independent learning. True learning is the mutual contact between students' hearts. In "nondirective teaching", what students learn, how they learn, and to what extent they learn must be determined by students' experience, needs, and interests according to their specific academic situation. The task of teachers is to create an independent learning environment for students, focusing on students' specific learning situations.

1. Learn the basics stage, students' mastery of knowledge is a purposeful, planned, step-by-step and regular formal learning activity under the guidance of teachers. Students often do not start from practice, so the specific purpose of learning is not very clear at the beginning, but relies on the inspiration and guidance of teachers, establishes the current and long-term learning purpose, stimulates the immediate and long-term learning motivation, and mobilizes the enthusiasm of mastering knowledge. The knowledge that human beings have formed and accumulated is strictly systematic, in which there is a distinction between basic knowledge and specialized knowledge, single knowledge and comprehensive knowledge. Therefore, students' mastery of knowledge is mainly completed through formal learning, with guidance, planning, step-by-step and purpose. To improve the efficiency of knowledge mastery, students must also follow the rules of understanding, consolidation, maintenance, and application exercises. To achieve this, you need to

rely on the guidance and help of teachers at first, and later you should gradually learn to learn on your own in accordance with the rules, so that you can master knowledge more actively and effectively.

2. Thematic discussions, before the discussion, teachers should assign the topics of discussion to students, arrange the key points, difficulties, keys and reference materials, guide the preparation process of students, and encourage students to actively participate and actively speak. As far as students are concerned, they should think carefully according to the topics set by the teacher. In the process of discussion, teachers need to play a leading role, guide and point out, grasp the direction of discussion, improve the quality of discussion, avoid deviation from the topic in the discussion process, go around in circles on issues that are not related to the focus, chatter on an issue, or quarrel with each other because of their own opinions. Therefore, teachers should pay attention to guiding students to speak and discuss around the center of the topic in the discussion, and grasp and deeply understand other issues related to the topic at any time according to the process of discussion. Once there is a digression, the teacher should remind the students to pay attention to the topic discussed, or temporarily terminate the discussion, sort out the students' ideas, so that the students' discussion back to the topic, at this time, the teacher can summarize the results of the current discussion, review the whole process, point out the problems that have been solved and need to be solved, and then grasp the direction of the discussion.

3. Ask questions, at the end of the student discussion, prompt the students to ask, are the specific conclusions observed only in these few examples, or are they applicable to the general situation? This is actually guiding students from observation, "What is it?" "To think" why? ". After guiding students to think and understand, they can further ask, "What is the use of this part?" What problems to solve" and "How can this knowledge be used to solve the problem?" "And thus, inspire students" from why? How to "turn"? The essence of this is to develop students' ability to identify problems, ask questions, analyze problems and solve problems. Therefore, in addition to explaining knowledge or guiding students to learn knowledge, students should be guided to ask "What is it?" in specific links? Why? how to use? Gradually enable students to have the habit of asking questions, and then the ability to think independently.

4. Identify the topic, the selection of a topic is the key to the research of the topic. The title determines the depth, breadth, significance, content and course of the research. Topic selection should not be blindly and sloppily. The

general idea is to find the problem - find the data - analyze the problem - determine the problem. There are certain misunderstandings in the selection of topics: the more fashionable, the better; The hotter the better; The bigger the better. In fact, the characteristics of small subject research are to seek cold in the heat, seek differences in the same, and make a big fuss. After selecting a topic and putting it into practice, it is necessary to clarify the creative process and creative method.

5. Summary and conclusion, in the summary, students should be guided to summarize new knowledge and promote the transition of students' understanding from the level of concrete experience to the level of abstract generalization. It is necessary not only to pay attention to the summary of conclusions, but also to recall the learning process of knowledge. In this way, the knowledge can be constructed in an orderly manner, the applicable context of knowledge and its ins and outs can be clarified, and the knowledge can be transferred quickly and smoothly. In addition, according to the examination of the exercise, grasp the common problems, and summarize the knowledge content, problem strategies, and thinking methods in a targeted manner. Summary is a necessary step in incorporating mathematical knowledge and skills into cognitive structures in the form of "assimilation", "adaptation" or "balance". The organization and guidance of appropriateness to guide students to summarize the general laws of knowledge and skills, recall the general methods of classroom learning and teaching research, help students better learn, remember and apply, give play to the overall advantages of the knowledge system and lay a good foundation for subsequent learning.

Guan Xin (2020, pp.25-27) Nondirective teaching is one of many teaching methods, coupled with its particularities: autonomy, initiative, independence and other distinctive characteristics, it is welcomed by the majority of teachers. Therefore, nondirective learning has gradually entered classroom teaching from a teaching word form and has become one of the commonly used teaching methods by teachers. For nondirective learning, it is difficult to give a uniform, rigorous definition and procedure. Nondirective learning is a learning-centered teaching method, in order to obtain certain learning results, students choose and use certain independent learning strategies, and make certain self-evaluation and self-feedback on learning methods and learning effects. Self-directed learning is an active, independent learning.

1. Determine the teaching situation stage of finding problems, teachers need to set up certain teaching situations to guide students' learning direction and determine the direction of knowledge content and thinking ability development. Clarify the common concerns of teachers and students, and achieve certain teaching

goals and learning goals. This link, teachers should try to encourage students to express their thoughts and feelings freely and independently.

2. Determine the link of asking questions, in this session, teachers need to encourage students to think independently, actively express their personal opinions, and propose their own problems. Students' active questioning stimulates their interest in independent inquiry and knowledge construction. The questions asked by students may be related to and contradictory to their existing knowledge, or they may be curious about the characteristics of the information itself. But no matter which aspect the question comes from, it reflects the beginning of students' active learning, and they will also have a greater desire to answer their own questions and interest in exploration.

3. Solve problems stage, after analyzing the relevant issues, students need to make certain learning plans and decisions. Teachers need to guide students' learning planning and decision-making to align with teaching goals, and encourage students' learning planning and decision-making related learning behaviors. Encourage students to formulate hypotheses from multiple perspectives: On the basis of clear problems, teacher education encourages students to put forward as many hypotheses as possible from different perspectives, rather than being too critical of these ideas, so as not to be prematurely limited to a solution to the problem.

4. Summary reflection and self-feedback stage, teachers need to guide students to report in a timely manner according to the results obtained by themselves from the process of discovering problems, asking problems, analyzing problems, solving problems, etc. And further improve their ability to analyze and solve problems. Finally, timely adjustment and improvement of students' learning behavior will lay a foundation for the improvement of independent learning ability in the future.

From the importance of academics, the researcher can synthesize nondirective teaching steps to be used in the research as follows table 2.1

Table 2.1 Synthesizing nondirective teaching steps

Rogers (1969)	Maryam Hasan (2013)	Lu Mingjuan (2019)	Guan Xin (2020)	My research detail
1) Identify the situation of help	1) Defining the helping situation	1) Learn the basics stage	1) Determine the teaching situation stage of finding problems	1) Study

Table 2.1 Synthesizing nondirective teaching steps

Rogers (1969)	Maryam Hasan (2013)	Lu Mingjuan (2019)	Guan Xin (2020)	My research detail
2) Exploring problems	2) Exploring the problem	2) Thematic discussions	2) Determine the link of asking questions	2) Discussion
3) Forming insights	3) Developing insights	3) Ask questions	3) Solve problems stage	3) Thinking
4) Planning and decision-making	4) Planning and decision making	4) Identify the topic	4) Summary reflection and self-feedback stage	4) Planning creation
5) Integration	5) Integration	5) Summary and conclusion		5) Summary analysis

From table 2.1, the importance of nondirective teaching theory: Nondirective teaching theories have broken the stereotype of traditional teaching curricula and promoted educational reform. This is a "student-centered", different from the previous "teacher-centered" curriculum framework, mainly to cultivate students' ability to assume learning responsibilities, which greatly promotes students' independent learning ability. From the study of the importance of many researchers above, the researcher synthesized steps to be used to develop an activity plan in training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students consists of five stages: 1) study stage, 2) discussion stage, 3) thinking stage, 4) planning creation stage, 5) summary analysis stage.

3. Component of nondirective teaching theory

Rogers (1969) "Student-centered" teaching theory and "nondirective" teaching ideas fully reflect his basic teaching ideas. First, "nondirectivel teaching" should create an atmosphere of acceptance in the classroom. Second, "nondirective teaching" revolves around the goal of developing individual and group students. Third, "nondirective teaching" does not completely abandon the role of teachers, but emphasizes the equal status of teachers and students.

1. Teaching must be people-centered. He proposed a "student-centered" view of teaching. Rogers transferred his insights and ideas in psychotherapy to teaching, proposing a "student-centered" theory of teaching, which should be said

to be a successful grafting of the "patient-centered" theory. Rogers believed that there needed to be an atmosphere of harmony, a relationship of sincerity, trust and understanding, and a sense of psychological security. Rogers advocates for creating a good interpersonal atmosphere that allows students to trust their own experiences and values, forming a true sense of self. Only under this condition can the creative potential of students be fully exerted, and the lively, autonomous, creative and adaptive personality can be formed and developed.

2. Teaching objectives. He believes that the goal of education is to cultivate new people with independent personalities and creative abilities who can adapt to the changes of the times. To cultivate such people, handling the interpersonal relationship between educators and the educated is the key to teaching, and teachers should put the issue of affection for students at the center of the teaching process.

3. Teaching principles. 1) We cannot teach others directly; we can only make the learning of others easy to unfold. 2) People learn with a focus on maintaining their own structure or strengthening their own structure. 3) Assimilation brings certain changes in its own constructs. 4) It is also the most important principle that teachers should put the feelings and problems of students at the center of the teaching process, and their own speech should be moderate.

4. On the learning process. He believed that real learning was the kind of learning that was distinguished from the simple accumulation of knowledge. Rogers offers his opinion on the content, conditions, and methods of this kind of learning. First, he argues that true learning can only be achieved "when knowledge is connected to those situations that are perceived as problems," that is, when it is used to solve problems that are important to the learner. Second, Rogers argues that humans have a natural tendency to learn. Third, he believes that for this kind of real learning to be successfully realized, it is also necessary for teachers to create an atmosphere in the classroom that facilitates the acquisition of real knowledge. Finally, he believes that true learning is a process of change and development, and it has no end or conclusion.

5. On the teacher-student relationship. The teacher is the guide of the students, the model of problem solving, the catalyst that initiates the learning process of the students, the help of the learning process, and the friends that the students can visit with their problems. Learner-centered teaching does not completely negate the role of teachers, it negates the traditional teaching that ignores

the requirements of students and replaces the guidance of students' thinking, and negates the role of "professors" played by teachers.

Yan Shouxuan (2006, pp.87-90) Said about students should be in the main position in teaching, decide the learning content, initiate learning activities and self-evaluate the learning effect, and highlight the value and participation of students' "self" in teaching. Therefore, Rogers emphasized that classroom instruction should encourage self-expression rather than self-defense, giving everyone a strong sense of belonging. To create the impression in teaching that "arguments are good and expected." "We strive to make the class a learning community full of care and trust. He objected to teachers being presented as "instructors" or "trainers", arguing that the role of teachers in the learning process of students was merely a waiter, figuratively likening them to "tuning forks", which means to resonate in response to the voice of students. In order to facilitate students' self-learning and promote students' self-realization, the main responsibilities of teachers in the teaching process are manifested in four aspects: to help students clarify their own thinking what to learn; Help students discover the personal meaning of what they have learned; Help students arrange appropriate learning activities and materials; Maintain a psychological climate that nurtures the learning process.

Li Baicun (2011, pp.5-8) Teachers should: 1) have a comprehensive understanding and meticulous care for students; 2) respect for the personality of students; 3) To establish really good interpersonal relationships with students; 4) Arrange learning activities from the perspective of students; 5) Be good at getting students to explain their values and attitudes; 6) Be good at adopting a variety of teaching methods, giving students more differentiated treatment, and so on. In other words, nondirective teaching is the process of helping students to find problems, analyze problems, and solve problems under the correct guidance of teachers, and it is the process of students' moral self-improvement, conscious exploration of knowledge, and spontaneous exercise of ability under the influence of teachers. In view of this, it is necessary to re-construct a new view of teaching, teachers, students, educational resources and evaluation.

Zhong Jianjun & Guo Zhihong (2015, pp.97-99) From the perspective of the purpose of education, Rogers emphasized that the purpose of education is not only to impart knowledge, but more importantly, to shape a perfect personality, and improve students' self-learning ability by developing students' potential; From the perspective of the teaching process, Rogers emphasizes the need to fully respect and develop the individuality of students and potential, based on "unconditional positive respect", he proposed the three elements of a good teacher-student

relationship: sincerity, acceptance, and understanding. Rogers listed a series of teaching methods for this purpose: forming a safe and trusting environment of harmony, sincerity, openness, trust and mutual support in the classroom, so that teachers and students can generate trust, confidence and a sense of security; Create real-life problem situations that motivate students to engage in learning activities.

Ding Shuping (2016, pp.12-14) His nondirective teaching model does have its own unique features in building sincere and harmonious interpersonal relationships and teaching atmosphere: First, sincerity means that teachers are truly and trustworthy in the relationship with students, so that students communicate with teachers with their true selves, dare to disclose their preferences and opinions, and build a trusting and harmonious teacher-student relationship. The second is acceptance, teachers must adhere to the values of neutrality like psychological counselors in the teaching process, and treat students nondirective teaching research needs and interests based on the theory of meaningful acceptance of learning are accepted unconditionally, and actively care for students' difficulties. The third is empathy, that is, teachers should learn to understand students' thoughts and behaviors from their own perspective.

Summarizes the component of nondirective teaching theory: Rogers' teaching model creates an atmosphere conducive to student acceptance; open exploration, students are unfettered and have no scruples to express their opinions, teachers only participate in discussions at the request of students, express their own opinions, and do not make any comments on students' views; individual or group identification. Faculty provide resources to reflect and discuss the results of their explorations. There may be no conclusions, which doesn't matter, because the process of exploration is already there and students are already learning and working creatively. If the student wishes to be taught by the teacher, the discussion may be taught without a concluding or concluding statement.

Training course

The training course is mainly based on training and the trainees can master a certain skill through training, observation, etc. The training is primarily skills-based, with a focus on behavioral practice. To achieve unified scientific and technological specifications and standardized learning, through modern information processes such as goal planning and setting, knowledge and information transmission, skill proficiency exercises, homework, and achievement evaluation. Trainees can achieve the expected level of improvement goals, improve personal ability and work ability through certain means. Hu Xiaoyong (2019, p.88) said that training courses in the

information age Technology can be used as a new component of teacher training content. It can also be used as a new way to support teacher training.

1. Importance of training course

Jennifer Herrity (2013, p.15) In reality, there are many benefits of taking training courses that can outweigh the costs and time commitment, and ultimately help you reach your goals faster. Through training, students can up skill and improve their performance at study. Even well-qualified professionals have to go through training as all organizations have specific requirements from each role, and any prior knowledge may not necessarily cut it. Constantly learning through various methods as and when required is the best option in these professional environments. It is vital to be trained before the initial phase of any new project to ensure that everyone on the team is on the same page and well-prepared for the project and its challenges. Here are four convincing benefits of taking training courses.

1) Gaining a different perspective. When you're stuck in the same learning task for a long time, it's easy to get bogged down in everyday tasks and lose sight of the big picture. However, when you attend a training course, you are exposed to new ideas and concepts that can help you gain a different perspective. This can be especially useful if you work in an educator or administrative role. For example, if you're a teacher, taking a course on new teaching methods can help you improve student outcomes. As plenty training's trainers explain, by learning from the experiences of other educators, you can find new ways to engage and motivate students. Even if the course is not directly related to what you are teaching, it can still provide valuable insights that you can apply to your teaching.

2) Staying up to date with the latest trends. The world is constantly changing and evolving, especially in teaching. To stay ahead of the curve and maintain excellent teaching capabilities, it is essential to keep up with the latest industry trends. Training courses can help you do this by educating you with the latest best practices, tools, and techniques.

3) Developing new skills. Even if you’re an expert in your field, there’s always room for improvement. And as the saying goes, “The only way to get better is to practice.” By taking training courses, you can develop new skills and hone your existing ones. This will make you more well-rounded and knowledgeable, which can make you more valuable to your employer. Not to mention, having strong skills can give you more confidence in your abilities, which can improve overall job performance. So, if you want to stand out from your colleagues and take your career to the next level, investing in yourself by taking courses is a great way to do so.

4) Networking with other professionals. Another great benefit of taking training courses is that it allows you to network with other professionals. If you're taking an in-person course, you'll have the chance to meet people from all different backgrounds and industries. And if you're taking an online course, you can connect with people from all over the world. Either way, you can use these connections to further your career. Or you may meet someone who can give you valuable advice or feedback. Building a strong network of professional contacts can be very beneficial in your career, so it's worth taking a course to make those connections.

Shan Li (2015, pp.129-133) Training course development practice to improve the application ability of college teachers' courses. To improve the course model design of college teachers' course application ability, a "trinity" training course in the field of education theory, teaching application field and technical support field is constructed, and a new task-driven textbook structure and teaching method based on flipped classroom are proposed. Here are three convincing benefits of taking training courses.

1) Learning opportunities. One of the important things about training is to provide learning opportunities for students. It doesn't matter if the student is experienced or not. At some point, they will have to improve their skills to keep up with the latest technologies and developments. Training provides students with the opportunity to do this and improve their skills.

2) Strength development. A weak team will only hinder the growth of the organization. In particular, with the continuous optimization of the teaching environment, it becomes crucial to organize the team and play to its strengths. Pedagogical training programs are designed to help students focus on their strengths and further work to develop them.

3) Addressing weaknesses. As much as it is important to work on your strengths, it is equally important to address your weaknesses. In a studying environment, weaknesses could mean skill gaps. There are training methods available that are perfect for filling such skill gaps and help students become more proficient.

Katie Tran (2018, pp.114-117) Training course and further skills development is crucial as it represents a good opportunity for students to grow their professional knowledge, study skills. Training programs can increase their engagement at study and prevents the risk of experiencing study place burnout. By engaging them in student training, this allows them to break up their daily core responsibilities. Training course also allows student to be reflective of their professional journey and development and it can even empower them to be more innovative and creative at

study. This can even further encourage them to take risks, helping them feel more positive at study. Here are four convincing benefits of taking training courses.

1) An opportunity to improve skills and knowledge. Training course allows students to further develop their skill and add their knowledge. Taking the opportunity to improve the skills and knowledge of students not only builds on their professional development, but it allows them to feel valued.

2) They are likely to take on higher responsibilities. Encourage continued learning to develop the potential of each student further. Ever noticed that there are students out there who do what's expected of them but never really go above and beyond? By putting them through training that helps develop their skills and knowledge beyond what they already know could encourage students to take on more complex responsibilities. Sometimes students need that little push to realize their full potential and providing them with further education can allow this.

3) Training course can help improve study satisfaction and morale. By putting students through a relevant course that ties in well with their role, it can equip them with the skills and knowledge needed to feel confident in performing their duties. This in turn can bring positive team morale, giving students a sense of purpose towards their work.

4) Improve communication. When looking at the importance of training course, it’s important not to forget the impact on communication. Team-focused training can help to improve connected and communication between team members. In fact, training course has been shown to help individuals develop beneficial neural, cognitive, and behavioral patterns that they don’t develop individually.

Xia Yueman (2020, pp.154-157) The training goal of the visual communication design is to cultivate students into visual communication design talents who adapt to the needs of the innovation era, have basic knowledge, basic theories and basic skills in visual communication design. In terms of professional training goals, students should have a strong sense of responsibility and good humanistic accomplishment, advanced aesthetic ability and system design knowledge, as well as strong sense of innovation and practical ability, and be able to develop visual communication design related fields in the team. According to the background of the sustainable development of universities, the cultivation of visual communication design talents needs to have certain innovation and optimization. It should be socially oriented, and practical skills modules should be added to the training goals, which can strengthen students' practical ability and promote the continuous improvement of students' comprehensive literacy.

Wang Runlan (2021, pp.26-27) Development and implementation of school- based training courses on information technology application competencies for primary school teachers: Based on a Demand-Based Perspective. Here are five convincing benefits of taking training courses.

1) Gaining A different perspective. When you're stuck in the same study for a long time, it can be easy to get bogged down in the day-to-day tasks and lose sight of the bigger picture. But when you take a training course, you're exposed to new ideas and concepts that can help you gain a different perspective. This can be especially helpful if you're working as an educator or in a managerial role.

2) Boosting students performances and ability. Training courses help organizations optimize students' performance. Enhancing their knowledge and skills, in turn, can have a positive impact on their performance. Training implicitly motivates students to perform more efficiently. Thus, training courses effectively helps organizations get the best out of their study group.

3) Adherence to quality standards. Every group has its own requirements, which means that the skills of students may or may not be enough for a particular role. This is especially true for new students who are usually unaware of how the group study. So, this is a good way to introduce them to their study and what will be expected from them as the students of that group.

4) Consistency at study. One of the most important benefits of training students on soft skills is that they develop a great study ethic and improves communication at the study place. Naturally, it introduces consistency at study and, again, drives productivity in the group. This is due to the positive impact that the training instills on students. They will be able to project the same energy into the study they do.

5) Developing new skills. Even if you're an expert in your field, there's always room for improvement. And as the saying goes, "The only way to get better is to practice." By taking training courses, you can develop new skills and hone your existing ones. This will make you more well-rounded and knowledgeable. Not to mention, having strong skills can make you more confident in your abilities.

Colin Burton (2021, pp.56-58) The importance of training course lies in the opportunity to strengthen your students' existing skills and learn new ones, helping to boost individual and organizational performance. Training course allows students to become more effective. One of the main importance is leveling up your existing study force through the teaching of new skills. Training can help strengthen your students' capabilities while adding even more skills. Here are two convincing benefits of taking training courses.

1) Increased productivity and performance. Training course has a direct impact on your group's productivity and performance. Training course gives students a better understanding of their responsibilities and the knowledge and skills they need to do that study. This will improve their confidence. In fact, more than 80% of respondents believe that more training would help them meet their goals.

2) Building team spirit & supporting culture among the students. When a group of students become well skilled & knowledgeable for performing their assigned work, they become confident and eager to support others willingly to perform their study roles successfully. Thus cooperative/supportive culture prevails among the students which boost up team spirit & results in higher productivity.

From the academic definitions above, it can be concluded that training has many advantages. Everyone should seek to be a lifelong learner and set themselves goals to improve their skills and knowledge, and to learn how to apply these in a real-world setting. Training course is integral to ongoing personal and professional development. Developing training curricula can truly improve student learning literacy, and at the same time meet the needs of their own growth, so that they can survive better in the learning environment.

2. Development process of training course

An effective training courses should be established in a systematic and step-by-step process. Stand-alone training sessions, which consist of one-off activities, often fail to meet organizational goals and training participants' expectations.

Karen Cozzie (2013, pp.56-58) states, training requires continuous training. Being able to provide training both online and face-to-face is important. Therefore, the sequence of development processes in the training course is as follows:

1) Assess training needs: The first step in developing a training plan is to identify and assess needs. Needs assessments help you determine which teams or students need training, what they need, and the best way to deliver it.

2) Set training goals: The training needs assessment (organizational, task, and individual) will identify gaps in your current training program and student skills/knowledge. These gaps should be analyzed, prioritized, and translated into the organization's training goals.

3) Create a training plan: The next step is to develop a comprehensive action plan that includes learning theory, instructional design, content, materials, and other training elements. Start by designing relevant training courses that are engaging and aligned with your organization's goals.

4) Implement the training program: The implementation phase is where the training program comes into play. The progress of participants should be monitored during the training to ensure that the plan is effective.

5) Evaluate & revise training: The last segment mentions that the training program should be continually monitored. Ultimately, the entire program should be evaluated to determine if it was successful and met training objectives.

Lisa Evans (2020, pp.13-14) Student training courses have the ability to be a very successful and useful resource and continuing education seems to be valued by the workforce. In fact, according to TalentLyft, "90% of students will learn longer in the classroom if there is an investment in learning." Therefore, the training course development process has been proposed as follows.

1) Assess your needs and develop goals and success metrics. The first step to any successful training course is to establish your goals and figure out what you need to successfully achieve them.

2) Determine the type of training course for the student. When discussing your goals and objectives, you also need to consider the type of training program you want to implement.

3) Develop learning objectives/outlines. What topics do you want to cover? What is the most important message? How do you want to start and end? Figuring out the answers to these questions will help drive the structure of your training course program and ensure that you reach all the points.

4) Finalize your training plan. After you have an established outline of your learning objectives, it's time to get into the details. Tip: Keep learning objectives with you to make sure your plan adequately addresses each one. Adjust your plan as needed.

5) Design and develop training materials. A training course is only as good as its training material. As Indeed explains, "Before you start development, you must prepare your design well enough to ensure that it doesn't get lost or fail.

6) Implementation training. Between hands-on training, explain the ground rules and communicate your expectations before you begin.

7) Evaluate training. Evaluation and feedback are also an important part of the training process. It's a good idea to ask students for such feedback as soon as the program is completed so that everyone remembers the information well. Consider online surveys or questionnaires for efficiency.

8) Reevaluate as necessary. Just like with any type of program, it’s best to reevaluate within a predetermined amount of time. What’s working? What isn’t? Have the objectives changed? Do you need to measure metrics differently?

Madison Boehm (2022, p.3) Training courses are an integral part of any program or activity that involves knowledge acquisition and retention. The best way to develop an instructional curriculum is to start by reviewing the training program and available resources. There are some strategies for developing training courses:

1) Determine the objectives of the training course. The goal might be to teach computer lab managers how to access and navigate various software programs.

2) Develop a training plan. A plan is an overview or outline of how training will be approached. It typically includes the training program schedule, key learning objectives and a list of the available resources.

3) Write detailed guides for all students or participants. Provide step-by-step instructions written in a way that is as easy to understand and clear as possible. Include daily tasks and examples of what to and don't do.

4) Write an explanation of the core skills to be learned. This is an overview of what course participants can expect to learn after completing the training course.

5) A separate section is dedicated to each learning objective. For example, when teaching students to create information modules, instructors provide an entire chapter of various information basics.

6) Integrate visual elements. Use graphics, videos, tables and other visual tools to reinforce important concepts.

7) Incorporate review exercises. To accommodate various learning styles, integrate review exercises in various formats. For example, training materials may include true or false or multiple-choice questions to reinforce content. After watching an instructional video, ask students to break up into small groups to discuss the content.

8) Establish the assessment component. If using videos or presentations to train students, evaluate students by asking them to write down their impressions. When you create a training workbook, you can use quizzes to assess knowledge.

Javaid Arshad (2023, pp.9-10) The process of developing training consists of the following 10 steps. 1-4 steps constitute an analysis of the tasks necessary to design and develop relevant, useful training materials. Steps 5-10 are considered design and development process as follows:

1) Define the target population. The target group is the group of learners for which the training is intended. It is crucial to define this grouping so that the training can be designed appropriately. For example, the training of clinicians will be very different, from training new community health workers, even though they may do some of the same tasks.

2) List the tasks to be performed by the target population. To list the tasks to be performed by the target population, it is necessary to know what "good performance" is, and in other ways, what a good performer will do in his job.

3) Make a list of the skills and knowledge you need to complete the task. For each task involved in the learning process, the training developer next lists the skills and knowledge required to perform the task. Skills are usually actions such as measuring, mixing, recording, calculating, communicating, or making decisions. The required knowledge is the information needed to complete the task correctly.

4) Select the skills and knowledge you want to teach (training objectives). Experts use a series of criteria to decide which skills and knowledge to include in the training. These will form the training objectives of the course. Selection criteria may include the following factors: The first list shows the factors that may lead to inclusion in the course; The second list shows that skills or knowledge that will be suggested to be excluded (not taught) from the course.

At 5-10 steps: parts of the design process, the training developers organize the selected skills and knowledge to be taught into logical teaching units:

5) Organize selected skills and knowledge into appropriate teaching units (modules) and develop a training design (including a brief overview of the module content and the planned training methodology).

6) Draft expanded outlines of modules, including instructional objectives, main body of text, and descriptions of training methods, examples and exercises.

7) Experts provide realistic examples and information for use in exercises.

8) Draft the complete modules, facilitator guidelines, and course director guidelines.

9) Field-test the training materials.

10) Revise and finalize training materials based on the field test.

Table 2.2 Synthesizing the development process of training course

Karen Cozzie (2013)	Lisa Evans (2020)	Madison Boehm (2022)	Javaid Arshad (2023)
1) Assess training needs	1) Assess your needs and develop goals and success metrics	1) Determine the objectives of the training course	1) Define the target population
2) Set training goals	2) Determine the type of training course for the student	2) Develop a training plan	2) List the tasks to be performed by the target population

Table 2.2 Synthesizing the development process of training course (continue)

Karen Cozzie (2013)	**Lisa Evans, PhD (2020)**	**Madison Boehm (2022)**	**Javaid Arshad (2023)**
3) Create a training plan	3) Develop learning objectives/outlines	3) Write detailed guides for all students or participants	3) Make a list of the skills and knowledge you need to complete the task
4) Implement the training program	4) Finalize your training plan	4) Write an explanation of the core skills to be learned	4) Select the skills and knowledge you want to teach
5) Evaluate & revise training	5) Design and develop training materials	5) A separate section is dedicated to each learning objective	5) Organize selected skills and knowledge into appropriate teaching units
6) Implement ation training	6) Integrate visual elements	6) Draft expanded outlines of modules	6) Implementation training
7) Evaluate training	7) Incorporate review exercises	7) Experts provide realistic examples and information for use in exercises	7) Evaluate training
	8) Reevaluate as necessary	8) Establish the assessment component	8) Draft the complete modules
			9) Field-test the training materials
			10) Revise and finalize training materials based on the field test

From table 2.2 the above-mentioned development process of training course. The design for each training course, in conclusion the target group was analyzed, scope of content, learning objectives after the training course design an activity plan, the exercises support a variety of learning styles to reinforce the content, preparation of teaching materials and create assessment elements. This includes providing examples and

exercises to practice using information on skills and knowledge. For example, examples may be provided through images, live demonstrations, or videos.

3. The development of training course based on nondirective teaching theory

Effective training courses enable individuals to learn new skills or update existing ones and enable them to apply those skills to improve themselves. It empowers them and expands their options for solving problems. The use of non-instructional teaching theories to develop training courses requires high students' initiative, that is, to improve their abilities in a short period of time, and to get rid of the old model of teacher-led classrooms, which is not only a challenge for teachers, but also has high requirements for students' own control.

Andrew Barry (2014, pp.35-38) Almost everyone recognizes the value and benefits of training courses. When done well, training courses can improve students' learning abilities. The use of nondirective pedagogy in training courses should enable students to adapt to and enjoy the classroom in a short period of time. Conducting short-term training not only makes students curious about the class, but also fantasizes about the next training session, and can fully express themselves while improving their skills. There are several points on how to develop nondirective pedagogy in training courses: 1) Perform a training needs assessment. The first thing you should do is to analyze the problem to get a better idea of what's causing it and to see if training is really the best solution. Imagine someone at study perceives a problem and thinks a new training program might resolve it. Before anyone rushes off, creates training materials, and conducts the training, it's a good idea to take a step back and assess the situation. 2) Keep student self learning principles in mind. You can see how these principles relate to the learner characteristics you identified during your training needs assessment. And you can imagine how they should affect your training during design and delivery. 3) Develop learning objectives. A learning objective may address. Things that your student can know, such as what tasks do they need to complete independently in this class and what abilities they need to improve. 4) Design and develop your training materials. You may create a variety of training materials using several different tools during this step. Word, Excel, PowerPoint and similar "Office" programs to create handouts for students. 5) Implement and evaluate the training course. Once you've designed your training course objectives, you need to implement them. But in nondirective teaching, you only need to teach students the basics so that they can better understand. Students need to analyze the problem on their own, ask questions, and then solve them. In the assessment test,

students can better use the knowledge of self-learning to show different abilities, because then everyone is diverse.

Dan Gorgone (2019, pp.14-18) said if you want to really develop nondirective teaching theory in training courses, you should identify the right path for your course first. And then, identify key elements: What do you need to teach? Who needs the training courses? Can student understand knowledge by themselves? 1. To create powerful training that makes a significant impact, it's vital to identify a specific and pressing problem that you or your student is facing. Determine the key metric you want to improve and develop training that will provide a solution to this issue. Offering a single training course is just the beginning. To solve your problems completely, you'll likely need to provide a comprehensive learning program. As your team gets more proficient with new apps or solutions, some may need additional training to acquire more advanced skills or learn new tactics. 2. Which students will take action based on the course(s) you produce? Knowing your student will help you create the right content using the best formats: instructional video with screen recording, text, PDF checklists, downloadable guides, mobile-friendly content; you name it. 3. Determine whether students can complete their understanding of knowledge according to the guidance of the teacher.

Serhat Kurt (2020, pp.6-8) Allow enough time to carefully plan and revise the content of the training session. Careful planning will make teaching easier and more enjoyable, as you need to motivate students to make better use of non-instructional instruction. Talk to other teachers who teach similar content, discuss various strategies and students' reactions to the material, etc. In the case of team teaching, meet with your partner to discuss course objectives, educational philosophy and methods, general content, classroom policies, and what each teacher will be responsible for. First, pinpoint the course goals: What do you want the students to learn and be able to accomplish? With your goals clearly defined, decisions to include certain content, the teaching methods to employ, and the types of assignments and exams to utilize can be more readily determined. To help with curriculum planning primarily in defining goals to maximize student learning. Second, identify course content: 1) choose main topics. 2) reduce the list of topics accordingly. 3) organize the class structure and the topics to be taught with a clear rationale so the material is most understandable to your students. Third, develop the teaching methods and tools: After the course goals and content are determined, it is time to think about the content and how you will present it. You will need to choose your teaching methods and tools based on the 1) appropriateness for the

class size and 2) those that are aligned with the course goals. Fourth, decide on the method of evaluating the learning of your students. Organize the assignments and exams. Remember that evaluation must align with the course goals. For example, if a course goal is to sharpen problem-solving skills, then the exam should focus on a question that uses problem-solving, not mainly recalling facts.

Visual communication design ability

Visual communication design ability is the product of a process of realization and unique expression of an idea. Through the expression of production, balance, distribution, pattern, repetition, contrast, size, color, value. Design implies a relationship between the part and the whole. In the end, what we want is unity, harmony, elegance and rhythm. All of this requires a high level of visual communication design, intuition, judgment and experience. The ultimate goal of visual communication design is to complete the visual transmission in the audience's brain, generate value recognition and feeling cognition, and form a unique memory of the brand or product. Therefore, designers are required to have extremely high visual communication design ability, and the final output is stimulated by people's visual senses to form a unique cognitive feeling in the brain.

1. Meaning of visual communication design ability

Ju Dongting (2017, p.11) Visual communication design ability is an active act of communicating a particular thing through visual forms. Most or part of it relies on vision, and is represented in the image of two-dimensional spaces such as signs, typesetting, painting, graphic design, illustration, color and electronic equipment. The improvement of visual communication design ability is to improve students' market adaptability: visual communication design is a highly practical major, and students can only improve their visual communication design ability in school teaching, so as to combine the content they have learned with market demand after graduation and enter the job, so as to improve their professional adaptability.

Lin Zixiang (2019, pp.249-250) Visual communication design ability meaning is: good design the work not only has its "shape" because of its exquisite production, but also has "god" because of the support of profound cultural heritage, "both form and god" can truly be called an excellent design work, and only such works can truly realize the beautification of public life and improve.

Paul Rand (2019, pp.143-147) Visual communication design competency refers to the ability to use visual elements and symbols to convey information, express thoughts, emotions, and intentions. This ability covers a variety of fields such

as graphic design, advertising design, etc. A person with the ability to design visual communication should have the following skills and knowledge: 1. Creative Thinking: Ability to think and solve problems from different perspectives to create unique, original and attractive design works. 2. Aesthetics and design principles: Familiar with basic design principles such as formal beauty, color matching, typography and layout, and be able to apply these principles to actual design. 3. Semiotics: Understand the meaning, symbolism and metaphor of symbols, and be able to flexibly use symbols to convey information. 4. Graphic design software: master the commonly used graphic design software, such as Photoshop, Illustrator, etc., and be able to use these software for design and typesetting. 5. Brand image design: Familiar with the basic elements and methods of brand image design, and be able to develop a unique visual identity for the brand. 6. Product design: master the basic principles and skills of product design, and be able to design items that meet the brand image according to the characteristics of the product. 7. Learning ability: Have the awareness of continuous learning and self-renewal, and constantly master new design concepts and technologies.

Li Yanni (2020, pp.172-174) Visual communication design ability is a design ability that is expressed and conveyed to the audience through visual media, reflecting the characteristics of the times and rich connotation of design, and its field is constantly expanding with the progress of science and technology, the emergence of new energy and the development and application of product materials, and intersects with other fields, gradually forming a new field of design that is related to and cooperates with other visual media. In the field of spiritual culture, its unique artistic charm affects people's feelings and concepts, and plays a very important role in people's daily life. With the progress and development of the times, we are also constantly pursuing higher-level design capabilities, and are also trying to develop with multi-level industries.

Summary of the meaning of visual communication design ability: Visual communication design ability is an active act of communicating a particular thing through visual forms that is expressed and conveyed to the audience through visual media, reflecting the characteristics of the times and rich connotation of design, and its field is constantly expanding with the progress of science and technology. Most or part of it relies on vision, and is represented in the image of two-dimensional spaces such as signs, typesetting, painting, graphic design, illustration, color and electronic equipment. The process of conveying some specific information to the communicated object through a visual art form with a certain purpose as the precursor, and influencing

the conveyed object. The so-called "visual symbols", refers to the eyes can see the symbols that can express the certain nature about poster, sign and various design products. Visual communication design ability is an individual's insight into design and familiarity with their own ability, and good design ability is the cornerstone of creating excellent design works in the future. Visual communication design ability is a comprehensive skill and ability that requires continuous learning and practice in order to continuously improve one's level.

2. How to improve visual communication design ability

He Yiliang (2020, p.175) Only by mastering solid professional knowledge and professional theoretical foundation can we be able to understand the profession knowledge is used flexibly and designed. Therefore, if you want to cultivate students' design ability, you must improve your professional quality. Teachers need to stimulate students' interest, so that students can deeply understand the connotation, operation techniques and theoretical knowledge of visual communication design, and constantly broaden their horizons. At the same time, it is also necessary to enable students to grasp the knowledge of other related disciplines to lay the foundation for innovation. At the same time, students need to learn to look at and solve problems with dialectical thinking, so that they can think comprehensively about problems, otherwise they will form a one-sided impression of the problem, which is not conducive to the formation of innovative thinking.

Guo Qinghong (2018, p.186) In the teaching process, it is necessary to advocate that students use their different visual design performance elements to create a new visual image personalized with reality according to their own understanding, and guide students to express their aesthetic emotions through suitable design forms. Objective and subjective, rational and emotional, representation and expression of emotional expressions need to be trained in the teaching process. Designers need to think from the perspective of the viewer, combine the development needs of the public with visual communication design, truly highlight the emotions of the work, and increase the society it will communicate with the public with art creators and visual communication design works. Constantly observe the changes in the social atmosphere, integrate the relevant content of social values, and get as close to the emotions of the public as possible.

Hu Fei (2019, p.1) Teachers should guide students to integrate traditional cultural elements into visual communication design and get rid of the shackles of traditional design teaching deeply integrate the knowledge of different disciplines, enrich teaching elements, expand the teaching activity space, and promote students'

understanding of traditional culture. Teachers can guide students to integrate traditional cultural content such as paper-cutting art and Chinese painting art in the teaching of visual communication art and design, so as to drive students to think deeply and let students look at the world and feel richer. Art and design knowledge, enrich students' artistic thinking, and improve students' ability to appreciate works in the appreciation of excellent works.

Shao Wenjie (2020, p.146) Core courses and practices in professional design in the course of this course, a thinking teaching mode should be constructed, students' creative thinking should be cultivated, students should be encouraged to be independent and original, and students' practical ability, hands-on ability and adaptability should be strengthened. At the same time, in the teaching process, in addition to classroom teaching, teachers should take students to the teaching practice base outside the school for on-site observation and learning, listen to professional designers talk about design experience, let students grasp the pulse of the times, and create solutions with application value that meet market demand.

Wei Lai (2020, p.3) Visual communication design ability pays the most attention to the practical and cognitive aspects, first of all, you need to be interested in design and stimulate the ability to discover the beauty of design in life; Secondly, in practice, it is necessary to improve hands-on ability, not only the memory of knowledge, but also the basic operation ability of design. Here are 4 ways to improve your visual communication design ability:

1. Looking more, visual communication design is not an overnight creation, it is a process of continuous iteration and updating. The look here means that designers can enjoy a wide range of exhibitions, see good designs, poor designs, and judge the pros and cons of the designs, so that the visual design will become beautiful.

2. Taking more notes, taking notes or notes is the accumulation method that students have been ignoring. Sometimes you see something and find it very interesting at that time, but you don't know where it can be used. Write it down first. When you need to do a design later, the things you write down can bring a lot of inspiration to your brainstorming or design inspiration. So the meaning of notes at this time is to help students accumulate. When you find inspiration from various channels, collect it, write it down, and write some ideas at the time, which may not be used for the time being, but it may become a good development direction in your design projects in the future.

3. Multi-grinding, a design, constantly iterating and grinding in the update, is a comprehensive expression of patience, ability and enthusiasm. In the process of a

project, it is inevitable to face many challenges. Excellent students are good at giving full play to the spirit of grinding. They have incomparable enthusiasm for visual design major. With all their ability, they patiently grind one question after another, and finally let everyone agree and help promote the realization of design.

Summary of the meaning of how to improve visual communication design ability Under the background of the development of the era of comprehensive innovation, colleges and universities, as the main position of talent training, should improve the visual communication design ability as the main goal of talent training in the new era. For art design, innovation ability is the essential requirement, so is visual communication design. The cultivation of innovation ability has also received more attention from colleges and universities.

Measurement and Evaluation of the visual communication design

The standardized tests involved in the process of measurement assessment and evaluation enables the students to make better use of the data available in the daily classroom. It offers learners with an understanding of the role of assessment and evaluation in the instructional process. Measurement assessment and evaluation also helps the teachers to determine the learning progress of the students. Without measuring and evaluating their performance, teachers will not be able to determine how much the students have learned. The basic purpose of both measurement assessment and evaluation is to determine the needs of all the learners. Measurement assessment and evaluation also enables educators to measure the skills, knowledge, beliefs, and attitude of the learners. Assessment plays a vital role in evaluating the students' academic as well as interest and motivational values.

1. Types of Assessment and testing

At Dylan Wiliam (2016, p.6): Michael Scriven first proposed four types of classroom assessment in his research: positional assessment, formative assessment, diagnostic assessment. 1) Positioning assessment: Also known as placement assessment, preparatory assessment. It is mainly evaluated before specific teaching activities to determine students' preparation. The main problem to be solved is: whether students have mastered the knowledge and skills necessary for the scheduled teaching activities, to what extent they can achieve the preset teaching goals, the cultivation of learning interests, and what kind of teaching mode is better for the formation of learning habits. 2) Formative assessment: It is an evaluation carried out in the teaching process, which is an assessment of students' learning results and teachers' teaching effects in order to guide the correct and perfect progress of the

teaching process. The main purpose of formative assessment is not to select a small number of outstanding students, but to discover the potential of each student, enhance and improve student learning and provide feedback to teachers. 3) Diagnostic assessment: It is mainly to further evaluate the teaching background and all aspects of the student's situation, and it focuses on the in-depth investigation of repeated mistakes in students' learning. The purpose of diagnostic assessment is to design a teaching program that can remove barriers by identifying students who are above or below zero. Based on the results of these two aspects, we can check whether the teaching goals are set appropriately. 4) Summation assessment: It is an evaluation that judges the degree of achievement of the entire teaching goal after a relatively complete teaching stage. When using summation assessments, it is important to note that the results obtained through the assessment are not a single score, let alone a conclusion based on only one or several accidental summation assessments.

2. Multiple-choice Test

Roediger & Marsh (2005, p.1) A multiple-choice question is a question type or method in which one or more of the choices are selected as correct (or more appropriate) answers. There are many types of multiple-choice questions, generally including single-choice questions, multiple-choice questions (different from English Multiple Choice). Multiple-choice questions are popular with test writers and users due to a range of advantages. In addition to having the same test function as single-choice questions, multiple-choice questions also have different characteristics from other types of multiple-choice questions:

First, it can measure knowledge and ability at multiple levels such as memorization, understanding, analysis, and synthesis, which is in line with the requirements of the new curriculum standards;

Second, it can control the guessing behavior, because it is not the only correct option, the combination of options is varied, students cannot score based on guessing alone, only have a certain ability to ensure that the choice is correct;

Third, its scoring rules are fixed and consistent, with high reliability, and convenient scoring, which is conducive to the realization of computerized tests.

Jooyong Park (2010, p.7) said there are several advantages to multiple choice tests. If item writers are well trained and items are quality assured, it can be a very effective assessment technique. If students are instructed on the way in which the item format works and myths surrounding the tests are corrected, they will perform better on the test. On many assessments, reliability has been shown to

improve with larger numbers of items on a test, and with good sampling and care over case specificity, overall test reliability can be further increased. Some multiple-choice questions are given points for correct answers, and 0 points are awarded for incorrect answers or non-answers; Therefore, when students answer questions, 1 point can be awarded for correct answers, and 0 points for incorrect answers.

3. Rubric and authentic assessment

3.1 Rubric

Mitchell, V. (1991, p.2) shows that the grading standard is the basis used to evaluate the learning process of students in the bid evaluation process, and different grading items may have different grading standards. The scoring criteria can be divided into objective scores, which require all judges to give the same score, and subjective scores are scored independently by each judge according to their own understanding. The scoring standard can assign points to each assessment element according to the weight, and the full score of each question is the same, and the teacher scores the students within the score range according to their answers, and the scoring results are weighted and then the total score is calculated. The grading criteria can also be graded, with several specific reference standards under each grade, according to which the examiner scores within a segment.

Hsu, C, & Sandford, B. A. (2007, pp.12-13) His research shows that the evaluation standard is the benchmark for measuring the scores of various evaluation indicators obtained by the evaluator through measurement or through agreement with the person being evaluated. There are three elements: standard intensity and frequency, labeling, and scale.

3.2 Types of rubrics

Popham (1997, p.4) The pedagogical terminology “rubric”, in general, refers to “a scoring guide used to evaluate the quality of students’ constructed responses”. They are typically presented in table format and consist of four basic elements.

Clara A.Nkhoma (2020, p.2) namely, scoring criteria, a rating scale, definitions of each criterion and descriptions for specified performance levels.

However, there are several types of rubrics specified by their composition and contend to fulfil the educational objective of the courses. In terms of particular object of assessment and scoring strategy, rubrics are principally categorized into generic-rubric, task-specific rubric, holistic and analytic rubric (Dawson, 2017, pp.3-5). According to their level of specificity. Generic rubrics are shaped with performance criteria designed to reflect broad learning targets. For

example, a problem-solving rubric is useful in dealing with assignments on Math, Physics, Economics, and so forth; a reading rubric can be applied not only for literature courses. In fact, students often face similar learning processes when approaching different domains. With criteria that are general across different context, educators can save considerable time on creating rubrics for each specific task, students may easily capture the essential principles across disciplines as well (Bargainnier, 2003, p.8). At the opposite pole, task-specific rubrics are equipped with criteria and descriptions that represent specific features of a performance. Therefore, it is applicable for only one particular task, football dribbling for instance (Bargainnier, 2003, p.3). That narrow space of application is the trade-off for more reliable assessment and concrete descriptions to guide interpretation. It is worth noting that there is an open room for teachers who have the intention to harmonize the drawbacks of generic and specific rubrics without sacrificing their advantages. That hybrid rubric may contain generic language and some criteria that are task-specific.

Table 2.3 Comprehensive quality rubric

Point Level	Description of Student class performance
Level A	Listen very carefully in class, never lose your mind, play with mobile phones or gossip and other phenomena; Actively raise your hand to speak, and be able to actively participate in discussions and communication in English; Creative and critical thinking, boldly ask questions, experiment and express their ideas, be able to express their views and opinions in an organized and strategic manner; Good at cooperating with others, good at humble and patient listening.
Level B	Can listen carefully in class, without distraction, playing mobile phones or gossip and other phenomena; Be able to raise your hand to speak, and be able to actively participate in discussions and communication in English; Have certain thinking ability and creativity, ask certain questions, and try to express their ideas, and be able to express their views and opinions in a more organized manner; Ability to work with others and listening and accept others' opinions.
Level C	The class is more serious, occasionally distracted, playing with mobile phones or gossip and gossiping; Occasionally raise your hand to speak, and be passive when participating in discussions and communication in English; Thinking ability

Table 2.3 Comprehensive quality rubric (Continue)

Point Level	Description of Student class performance
	and creativity are not strong enough, ask fewer questions, do not express their ideas very actively, and can barely express their views and opinions in an organized manner; Working well with others is not good enough, but listening and accepting of other people's opinions.
Level D	The phenomenon of not listening to lectures seriously, distracting, playing mobile phones or gossiping is more serious; Basically do not raise their hands to speak, rarely participate in discussions; Poor thinking ability, lack of creativity, unable to accurately express their meaning, lack of organization, rarely ask questions, dare not try to express their ideas; Lack of spirit of cooperation with others, difficulty listening and accepting the opinions of others.

Source: http://wenku.baidu.com/view/english
(English for the workplace)

Table 2.4 Performance assessment rubric

Rating indicators	Evaluation requirements		
	Excellent	Good	Poor
Material selection	1. The material is very convenient, the material is appropriate, and it is practical (9-10 points).	1. The material is difficult to obtain, but the material is more appropriate (7-8 points).	1. The material is difficult to obtain and the practicality is not strong (less than 6 points).
	2. Material selection, environmental protection and energy saving (9-10 points).	2. The selection of materials is more environmentally friendly (7-8 points).	2. The selection of materials is not environmentally friendly (less than 6 points).
Production process	1. The design of the group protocol is very complete, and the production of various cell	1. The group protocol design is more complete, and the production of cell structure and the	1. The group protocol design is incomplete, does not introduce the production of cell structure and the

Table 2.4 Performance assessment rubric (continue)

Rating indicators	Evaluation requirements		
	Excellent	**Good**	**Poor**
	structures and the connections between cells are very detailed and specific (18-20 points).	connection between cells are briefly introduced (14-16 points).	connection between cells, or only introduces one of them (less than 12 points).
Production process	2. During the implementation process, the task division is clear, the cooperation between team members is tacit, and the efficiency of model making is very high (18-20 points).	2. During the implementation process, the division of tasks is clear, but the tacit cooperation between team members is not high, and the efficiency of model making is average (14-16 points).	2. During the implementation process, the division of tasks is not clear, the tacit cooperation between team members is poor, and the efficiency of model making is low (less than 12 points).
Gallery	1. The group model conforms to the principles of science and accuracy, the simulation of each cell structure is scientifically accurate, showing submicroscopic structure, complete cell structure, appropriate size ratio, and correct connection between different cell structures (18-20 points).	1. The group model basically conforms to the principles of science and accuracy, the simulation of each cell structure is more scientific, the connection between different cell structures is correct, but the submicroscopic structure is not well shown, and the size ratio is not very accurate (14-16 points).	1. The group model is not very in line with the principles of science and accuracy, the simulation of each cell structure is not very scientific, there are errors in the connection between cell structures, the submicroscopic is not shown, and the size ratio is not accurate (less than 12 points).

Table 2.4 Performance assessment rubric (continue)

Rating indicators	Evaluation requirements		
	Excellent	**Good**	**Poor**
	2. The model shows a three-dimensional structure, has a sense of creativity and art, can be preserved permanently, and has a low cost (9-10 points).	2. The model has a certain three-dimensional sense and low cost, but lacks creativity and artistic sense (7-8 points).	2. The cost of the model is high, does not reflect the three-dimensional sense, and lacks creativity and artistic sense (less than 6 points).
	3. When the group representative introduces the work, the language is scientific and logical, and the response to questions is flexible, highlighting the characteristics of the group (9-10 points).	3. When the group representative introduces the work, the language is fluent and the response to questions is more flexible, but the scientific nature is not strong, and the characteristics of the group are not highlighted (7-8 points).	3. When the group representative introduced the work, the language was not fluent, there were scientific errors, the response to questions was inflexible, and the characteristics of the group were not highlighted (less than 6 points).

Source: HTTP://www.slideshare.net/fengxinzi22/ss-12680276/
("Attempt to make a three-dimensional structural model of eukaryotic cells" expressive evaluation scheme)

Analytical rubric is a summative assessment tool that is used as a substitute for high-stakes testing. It's intended to focus more on practical or applied skills—more "do you know how to use your knowledge?" versus "tell me what you know." Other common terms include "authentic assessment" or "performance-based assessment." It can be an individual or group project, a portfolio (with potentially one or more pieces foregrounded) or an open-ended response exercise (Famularo, J., French, D., Noonan, J., Schneider, J., Sienkiewicz, E., 2018). The creation process of

the work is then graded according to a set of pre-agreed criteria or a checklist, shared with the student in advance. The headings are usually represented by a matrix, with the leftmost column listing the performance criteria for a single task, and the top row listing proficiency levels, descriptions stored in cells. The user obtains the total score by adding the results for all criteria. Performance assessment rubric looks at higher-order thinking skills and problem-solving abilities. Other features like time management and clear communication are also tested in these kinds of assessments. This ultimately leads to a deeper and more meaningful learning process (Hibbard, K.M., et al. 1996). Analytical rubric goes hand-in-hand with modern teaching strategies like active learning and critical thinking. If a student undertakes collaboration and discussion in a classroom context (and in formative assessment), those learned skills will be more easily applied and evaluated in assumptive assessments, and eventually reflected in students' performance (Helena Maguire, James K. Luiselli., 2022).

Table 2.5 Single-Point rubric

Working toward proficiency Areas that need work	**Proficient(3)** Meeting standard goals	**Beyond Expectations** Evidence of exceeding standards
	Standard 1-Analysis Theme concept and thematic statement are accurate. Character change is correctly determined and evidence is fully explained to support the main idea. **Score: _____**	
	Standard 2-Evidence Identifies powerful evidence that supports the main idea presented. **Score: _____**	
	Standard 3-Mechanics of writing Strong grasp of standard writing conventions (spelling,cannibalization and punctuation). Correct sentence structure throughout. **Score: _____**	

Source: https://pernillesripp.com/2019/02/24/using the single-point rubric for better assessment conversations/

A single-point rubric is used to measure learning against one performance level of the grading scale and provides an opportunity to discuss student performance strengths and weaknesses. The single-point rubric has only one column describing the passing level and each scoring criterion. Teachers rated each criterion as "not up to standard," "up to standard," or "out of bound." Teachers provide personalized feedback on any criteria that are rated "not up to par" or "over the mark" to let students know their scores. A single-point rubric will have the total score or percentage of the assessment. Each scoring criterion in a one-component gauge has a score or percentage value. Typically, the "Meets the criteria" column will receive an overall score or a A or B value. For example, an assessment value of 25 contains three criteria. This scoring tool is called a single point rubric because it only describes performance at a single level. Single-point rubrics provide teachers with the opportunity to provide personalized feedback on how students are exceeding or not meeting standards (Nicole Messier, 2022, p.6).

From the above concepts, it can be seen that there are many ways to measure the standard of ability, Therefore, in this study the researcher has developed criteria to measure the ability to solve the visual communication design ability problems consistent with the objectives and suitability as shown in Table 2.6.

Table 2.6 Development of scoring criteria used to measure the visual communication design ability

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
Poster Design	Deviating from the creative theme, the color matching is discordant, the composition is monotonous, and there is a lack of innovative elements in the design, most of which are patchwork. Students are not skilled enough in computer graphics, too flat, and there are no directional elements in the poster to	Students have a certain understanding of the use of software, have a certain drawing foundation, and can express the theme of creation, but the meaning is not obvious. Have their own ideas for creative production, the layout is relatively neat, but the color and composition are discordant, and some details are ignored. At the same time, the	Students can basically fully master the operation of the software and understand the basic knowledge. The poster work can fully express the theme, with imagination and innovative spirit. The color matching is also more harmonious, the composition is complete, but the elements used are too cumbersome, and the connection	Be proficient in using related software. The works are unique in creativity, clear and positive in theme, novel in expression, and always follow the principles of strong contrast and high saturation in the combination of colors. The overall spatial structure of the poster work is more reasonable, with a strong sense of three-dimensional, and the	The students' poster theme is expressed in novel forms, unique and ingenious ideas, and has rich imagination and expression. At the same time, it can correctly use design languages such as shape, color, texture, space, light and shade, etc, and the compositions is reasonable and complete. It follows the principle of unity

Table 2.6 Development of scoring criteria used to measure the visual communication design ability (continue)

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
	guide the audience. At the same time, there is a lack of finesse in the design process, too serious patchwork marks when looking closely at the work, and insufficient coordination between the parts.	creation is not novel enough, the idea is one-sided, and the picture tension is not enough.	between the elements is not close enough, so the visual impact of the audience is lacking.	design concept has deep meaning, which is thought-provoking.	of artistry and decoration, fun and originality. Proficient in using related software for creation.

Table 2.6 Development of scoring criteria used to measure the visual communication design ability (continue)

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
Sign Design	Students are not proficient in the operation of the software. The theme of the work is not clear, there is no originality, the grasp of graphics and color is lacking, and the visual effects and production level of the picture are poor. The final effect deviates from the required visual identity image, lacks	Students can use software to create simple logos. However, it lacks creativity and originality, can stick to the theme to highlight the corporate image, and is relatively harmonious in the use of color and shape, and the overall arrangement is orderly and complete.	The theme of the work is more prominent, has distinct personality characteristics, can reflect a certain sense of originality, and can make the audience clear corporate image. The use of form introduction is conducive to recognition, but the degree of similarity in the process of conveying information	The use of color is ingenious, the creative design is reasonable, the design of the work is novel, the use of the font is in line with the overall design, and the combination of logo and font is beautiful and generous. The layout design of the final renderings is beautiful and unified, and it is slightly lacking in audience communication.	Students can become proficient in using the software. The works have high originality, prominent themes, novel ideas, unified graphic design relationships, harmonious colors, accurate positioning, and pay attention to the visual language of publicity. It is ideological, inspiring, visually impact, and has the power to shape the logo of

Table 2.6 Development of scoring criteria used to measure the visual communication design ability (continue)

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
	unique personality characteristics and weakens the so-called easy to recognize and remember that was originally pursued.		is too high, which is not conducive to recognition.		clear information communication. It has affinity and the use of visual vocabulary has unique artistic characteristics.

Table 2.6 Development of scoring criteria used to measure the visual communication design ability (continue)

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
Product Design	Students are not familiar enough with the software to be proficient in design operations. The degree of innovation is insufficient, it does not have practicality, there are deficiencies in the production process, the shape is not aesthetically pleasing, the quality is not good, and it does not conform to the basic concept of ergonomics.	Students are familiar with some of the basic operations of the software and can draw simple layers, but cannot shape them in depth. It basically conforms to the basic concept of ergonomics, but lacks the degree of innovation, the shape is simple and not practical, and the selection of production technology and	Students can use the software to draw and model. It has a certain degree of creativity, exquisite appearance, and the choice of shape is in line with the basic demands of the product, but the choice of material and durability are not in line with the needs of the current design environment, and are basically in line with the concept of	Students are already proficient in the basic operation of the software and can carry out complex modeling activities. The product has a strong degree of innovation, not only for the audience is practical, emotional is also rich, but also reasonable craftsmanship and material matching has a certain ecological compatibility. In the	Students have fully mastered the operation process of 3dmax. The appearance design fully meets the market demand, assembly and packaging have a strong rationality, and the principle of product design meets the needs of product function realization. In the stage of design and development without omission and duplication, the

Table 2.6 Development of scoring criteria used to measure the visual communication design ability (continue)

Grading Criteria	Very Poor (1) No degree of completion	Poor (2) The degree of completion is not high	Fair (3) Medium completion	Good (4) High degree of completion	Very Good (5) The highest degree of completion
		materials deviates from the original design concept, in order to rise to the level of emotional expression.	ergonomics.	creation, attention was also paid to the safety and durability that the product must have.	appearance of the product and the use of materials not only meet the needs of the current market, but also fully reflect the functionality of the product.

Authentic Assessment

The term "authentic assessment" was originally coined by Grant Wiggins in the K-12 educational setting. Authentic assessment is a valid measure of intellectual achievement or ability because it requires students to demonstrate their deep understanding, higher-order thinking, and complex problem-solving skills by performing exemplary tasks. In the assessment literature, some authors argue that the term "real" was first introduced by Arch bald and (Newmann, 1996, p.4) in the context of learning and evaluation. (Cumming and Maxwell, 1999, p.8) rightly point out that authentic assessments and real achievement are interrelated, as it is important to determine desired student learning outcomes and readjust assessment methods. Real assessment should be rooted in real achievement to ensure a tight alignment between assessment tasks and desired learning outcomes. (Gulikers, Bastiaens, and Kirschner, 2004, p.1) further define "authentic assessment" in the context of professional and vocational training that includes competency-based courses and assessments. To better prepare students for the workplace of the future, assessment tasks used in professional and vocational education need to be similar to those students will encounter in future professional practice. According to (Darling-Hammond and Adamson, 2010, p.3), the role of performance evaluation is critical to helping teachers and students meet 21st century assessment and learning standards. Many authors in existing studies alternate between "performance evaluation" and "true evaluation". A thorough review of the literature revealed the need to distinguish between performance evaluation and genuine evaluation.

In summary, (Nkhoma, C., Nkhoma, M., Thomas, S., & Le, N. Q. 2020, pp.3-5) said: A rubric is not only an assessment tool useful for students in high-stakes exam. It is indeed an educational instrument supporting learners to select appropriate learning approaches, assisting teachers to design effective instruction strategies, and improve reliability and validity of assessment. Modern education philosophy places more emphasis on competencies and employ ability of students. Consequently, students are increasingly encouraged to participate in authentic learning activities. Assessment methods are also modified to ensure the alignment between learning, instruction, and assessment. However, authentic assessment can also be subjective. Using rubric as an authentic assessment instrument has been widely demonstrated to be useful in enhancing the reliability of authentic assessment. Moreover, other empirical results indicate that rubrics play an important role in authentic assessment regardless of levels or disciplines.

Related Research

Hou Wenhui (2002, pp.59-61) We know that art education focuses on and emphasizes students' expression and development of ideas and emotions in the process of creating and observing art. The stimulating learning that emerges from the art process offers great potential in every area of education. In addition to focusing on aesthetic understanding, our main focus is on the potential to recognize personality, build self-confidence and help students think. According to Rogers, the personal meaning of nondirective teaching refers to the relationship between the learning content and the individual. In a game that has "personal significance in learning, students perceive that the content of the learning is related to their own purpose. Our approach to education requires students to explore issues responsibly. The self-orientation and decisiveness generated by this approach are meaningful experiences not only in the fine arts, but also in other education. This research report, 36 students from the Art Department of Chengdu Institute of Education were selected for teaching experiments. In unguided teaching, the basic task of the teacher is to allow students to learn on their own, so that they can satisfy their curiosity and thus achieve a sense of success. Teachers need to help students understand what they want to learn, discover what they can do themselves, provide learning resources, help students learn the means to use, and decide for themselves how to learn.

Shi Wei (2012, p.92) In the traditional college design teaching, the "teacher-centered" way of teaching is not conducive to the development and stability of students' learning interest, and the neglect of student practice causes the lack of students' design practice ability and delays the optimal development period of students' design ability. The creation of a teaching atmosphere and environment is an important stage of nondirective teaching. In college design teaching, we should: Abandon the traditional "teacher-centered" teaching view, give play to the main role of students, and create an equal, democratic, an orderly psychological environment emphasizes the "interpersonal relationship" in teaching, encourages students to diverge their thinking, and optimizes the overall teaching environment, so as to fully stimulate students' interest in learning. In this study, 50 sophomore students from a university in Yantai City were selected as a sample group for teaching experiments, using "nondirective teaching methods" for teaching, and starting from "students" at various stages of the teaching process work from the perspective of the student, implement it with the students' own learning action plan, and end with positive action knot. This kind of teaching can not only expand students' thinking, stimulate students' interest in learning, but also fully play the main role of students from the perspective of students' psychology, so that students can continuously improve their

design ability in the process of independent learning. Finally, the research concludes that "student-centered" is the main educational idea of nondirective teaching, and the study of nondirective teaching is to develop students in an all-round way under the guidance of modern educational concepts, which is not only an urgent need for teacher teaching and student development, but also an inevitable requirement for the development of modern teaching theory.

Zeng Chunlan (2014, pp.118-120) Compared with those courses that are only suitable for traditional teaching mode, visual design courses are more flexible, and the time for teachers to teach is short in the teaching process, and most of the time in the classroom is given to students for practice and operation, and teachers mainly provide guidance. Therefore, teachers and students can directly interact, carry out close communication, and teach according to aptitude, at the same time, it is easy to achieve a relatively close relationship between teachers and students, and students will not be afraid of teachers, and they can be relatively equal to each other. In this study, 35 students were selected from the teaching class of secondary vocational schools. According to the author's observation of teaching at school, especially students in the past five or six years, because they have not developed good self-study habits since childhood, they are reluctant to take notes in class and do not know how to take notes. Without pre-exist before class and no review after class, even students with slightly better grades only complete their homework according to the teacher's requirements and will not expand their knowledge. In view of the above learning status of secondary vocational students, the study found that the most basic way for teachers to do a good job in teaching and guide students to learn consciously is to establish a harmonious teacher-student relationship. Because these students need emotional care more than other students, emotions can influence their behavior more. In order to stimulate their enthusiasm for learning, emotional factors are more suitable. Rogers' "nondirective" teaching emphasizes the development of students through the emotional sphere.

Guo Shanshan (2020, pp.3-5) In many middle school art teaching classrooms, students are often allowed to listen to the class alone, due to busy teaching tasks, high pressure on lesson preparation, etc., teachers do not provide students with some more flexible teaching methods, as well as vivid teaching methods. In this study, 45 students from Lanzhou Experimental Middle School were selected to use nondirective teaching theories to teach in the context of the new curriculum reform. With the continuous progress of science and technology in China, many new electronic teaching equipment has gradually come to our lives at the current stage, teachers should continue to learn to master this new electronic teaching equipment, help themselves to be able to carry out art classes efficiently,

and effectively cultivate students' ability to learn art knowledge independently. Secondly, teachers should exercise students' hands-on ability, lead students to contact more specific content related to art elements, and form a cognition of beauty and art in students' minds, so that they can draw what they see and hear through brushes, help students have stronger subjective learning initiative in the future art learning process, and enable teachers to achieve the purpose of nondirective teaching. If you want to use nondirective teaching methods to carry out art classes in the environment of the new curriculum reform, teachers need to constantly improve their own teaching methods, take students as the main body of teaching activities, provide them with more opportunities for mutual exchange and discussion, and interact with them accordingly. At the same time, art teachers themselves should also improve their professional qualities, carry out higher quality art classrooms, so that students can actively study art knowledge, face art teachers and art knowledge with a correct attitude, develop good learning habits that students should have in the new era, and improve the efficiency of teachers' nondirective teaching.

Huang Xuerong (2021, pp.110-111) The on-campus education of visual communication design is a phased process, and the professional needs of designers are rapidly changing, which requires students to develop good learning habits and strong independent learning ability in addition to mastering the professional basic knowledge of the discipline in the learning process. This paper investigates and studies the visual communication design major of Hainan Tropical Ocean University the learning status of 56 students in the sophomore year, combined with the background of "Internet + education", proposed a teaching reform strategy for visual communication design. According to the nondirective teaching theory, teachers should guide students to identify learning goals, formulate phased learning plans that meet their own development needs, and modify and evaluate the plans according to students' individual abilities. Secondly, teachers should guide students to report on stage achievements, encourage students to evaluate each other, form healthy competition, and adjust students' learning objectives in the next stage according to the quality of students' works. This study concludes that under the background of the "Internet + education" era, the previous school education model is being challenged, and the targeted and personalized feedback and services provided by the Internet make the formation of a personalized lifelong education system possible. The universality and equity of education also make the threshold for inter-professional getting lower and lower. Nondirective learning can not only help students improve their interest in visual communication design, but also cultivate good self-directed learning habits.

Chapter 3
Research Methodology

The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students. The methodology of this research was research and development. 1) to develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students. 2) to compare students' visual communication design ability before and after visual communication design learning based on nondirective teaching theory. The researchers have the following procedures.

1. The population / the sample Group
2. Research Instruments
3. Procedures for creating research instruments
4. Data Collection
5. Data Analysis

The population / Sample Group

The Population is: There were 912 fourth-year students from 24 classes in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023 (There were student's mixed ability, high level, medium level and low-level abilities.)

The Sample Group is: There were 38 fourth-year students from 1 class in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023. Through cluster random sampling.

Research Instruments

The development of training course based on nondirective teaching theory to improve visual communication design ability of fine arts. The research instruments were as follows:

1. Create 3 activity plans according to the nondirective teaching theory, 15 hours.
2. Visual communication design ability test (multiple-choice test and performance test).

Procedures for creating research instruments

1. Creating 3 activity plans

Procedures for activity plan according to the nondirective teaching theory creating activity plans details were as follows:

1.1 Studied guidelines for developing training course from many academics: Karen Cozzie (2013); Lisa Evans (2020); Madison Boehm (2022); and Javaid Arshad (2023) to design detail in developing the training course.

1.2 Index analysis based on the core learning content of the group. To set learning objectives learning content and teaching time.

1.3 Studied of concepts, theories related to the theory from documents, textbooks, and related research to create a learning management plan.

1.4 Create 3 activity plans on the subject about poster design, sign design and product design total 15 hours. By designing activity plan using the nondirective teaching theory, each activity plan specifies the details of the topics as follows: 1) Content, 2) Objective of learning, 3) Main point/concept, 4) Learning processes, 5) Learning activity, 6) Measurement and Evaluation, and 7) Instructional Media. According to the nondirective teaching theory as follows:

Step1 Study: At this stage, students are mainly required to systematically learn basic poster design knowledge and update the design concept through the learned knowledge points.

Step2 Discussion: In the following discussion stage, in the study of basic knowledge, students give their own judgments on a series of questions such as "why this style appears" and "how to choose a design style that suits you", students express their own views and opinions on some excellent cases, and explain the knowledge learned in the teaching of basic knowledge and can be applied to their own design concepts.

Step3 Thinking: In the next thinking stage, students should summarize the conclusions reached in the discussion stage, have a preliminary plan for their next design works, think about how to determine how to suit their own design theme and style, what design means to use, determine what kind of design theme is in line with the current situation, and choose what they are good at or like in the choice of design tools.

Step4 Planning creation: In this stage, students can create themes according to the advantages and disadvantages of excellent cases learned in basic learning,

Step5 Summary analysis: At the last stage, they should explain their design concepts and design processes and the troubles encountered in the design

process, and then students will conduct self-evaluation, mutual evaluation between students and evaluation by teachers.

1.5 The completed activity plan is presented to the thesis advisor to verify the suitability and consistency of the content. Alignment of objectives with learning activities and the possibility of activities. Then improve according to the suggestion.

1.6 The revised activity plan was presented to 3 experts for verification to verify the accuracy of the content appropriateness and completeness of the activity plan consistency of learning objectives, content, learning activities, instructional materials, as well as measurement and evaluation. And find the Index of Item Objective Congruence (IOC), the criteria for considering the consistency of the learning management plan are as follows.

Rating is +1. There is an opinion that “consistent to relevant.”

Rating is 0. There is an opinion that “Not sure it consistent to relevant.”

Rating is -1. There is an opinion that “Inconsistent with relevant.”

Each activity plan had an IOC consistency index greater than or equal to 0.50, so it was considered suitable for use in research. The result of the Index of Item Objective Congruence (IOC) analysis of this activity plan has an IOC = 1.00 for all questions.

1.7 Take the activity plan received from the review. Let's improve according to the suggestions of experts to achieve more accuracy before actually applying it to the sample group.

2. Creating design tests (multiple-choice test).

Procedures for creating the test of visual communication design ability**,** which is a multiple-choice test with 4 choices, a number of 41 items, with steps for create and find quality as follows:

2.1 Content Analysis: Competence and learning objectives consistent with the activity plan on poster design, sign design and product design.

2.2 Study the theory: Principles and methods of creating multiple choice tests from documents, textbooks and related researches.

2.3 Create multiple-choice test for 3 contents, each content was 20 items , totally 60 items to measure students' visual communication design ability.

2.4 Determine multiple-choice test scoring criteria 1 point for correct answer and 0 point for wrong answer.

2.5 Suggest the multiple-choice test to the thesis supervisor. Check for accuracy and make improvements as suggested.

2.6 The multiple-choice test is handed over to 3 experts for measurement and evaluation. Check the content validity, find out the Index of Item Objective Congruence (IOC). The criteria for judging the consistency of the test are as follows:

Rating is +1. There is an opinion that "consistent to objective of leaning."

Rating is 0. There is an opinion that "Not sure it consistent to objective of leaning"

Rating is -1. There is an opinion that "Inconsistent with objective of leaning.

Each item test had an IOC consistency index greater than or equal to 0.50, so it was considered suitable for use in research. The result of the Index of Item Objective Congruence (IOC) analysis of this activity plan has an IOC = 1.00 for all questions.

2.7 Improve and revise tests that have been verified by experts. Then take it to try out with students who were not a sample for 38 students to analyze the quality of the test.

2.8 Check the quality of each item test. The results were analyzed for difficulty value (p) and discrimination power (r) of the test. Tests were selected with difficulty value in the range of 0.20 - 0.80 and discrimination power of 0.20 – 1.00. (Landis, J. R., & Koch, G. G. 1977).

Criteria for interpreting the difficulty value (p) of the test

Difficulty value (p)	Meaning
0.81 – 1.00	Very easy (should be improved or eliminated)
0.60 – 0.80	Fairly Easy (Good)
0.40 – 0.59	Moderately difficult (very good)
0.20 – 0.39	Quite Difficult (Good)
0.00 – 0.19	Very difficult (should be improved or eliminated)

Criteria for interpreting the discrimination power (r) of the test

Discrimination power (r)	Meaning
0.60 – 1.00	Very good classification
0.40 – 0.59	well classified
0.20 – 0.39	Classified
0.10 – 0.19	Hardly distinguishable (Should be improved or eliminated)
-1.00 – 0.09	Not distinguishable at all (Should be improved or eliminated)

The results of the analysis were a test of 41 items with difficulty value (p) and discrimination power (r): Poster Design, there were 14 quality items, the range of difficulty value of between 0.29-0.71 and the discrimination power between 0.21-0.53.,

Sign Design, there were 14 quality items, the range of difficulty value of between 0.39-0.63 and the discrimination power between 0.21-0.53., and Product Design, there were 13 quality items, the range of difficulty value of between 0.37-0.61 and the discrimination power between 0.21-0.42. (Details in Appendix IV).

2.9 Checking the quality of the visual communication design test confidence values for the entire document are determined by Kuder Richardson's method (KR-20) = 0.79.

2.10 Take a visual communication design ability test that has been selected and determined to be of quality. Applied to the student sample group.

3. Creating design tests (performance test).

Procedures for creating design tests of visual communication design ability**,** which is a performance test for 3 contents, a number of 6 items, with steps to create and find quality as follows

3.1 Content Analysis: Competence and learning objectives consistent with the activity plan on poster design, sign design, and product design.

3.2 Study the theory, principles and methods of performance test from documents, textbooks and related researches.

3.3 Determine scoring criteria for practice tests by authentic assessments (holistic rubric) rating on 5 scales, 5=highest degree completion, 4=High degree completion, 3=Medium completion, 2=degree completion is not high, 1=No degree completion.

Table 3.1 Development of scoring criteria used to measure the visual communication design ability

Score Criteria	Very Good (5)	Good (4)	Fair (3)	Poor (2)	Very Poor (1)
Poster Design	Highest degree completion	High degree completion	Medium completion	Degree completion is not high	No degree completion
Sign Design	Highest degree completion	High degree completion	Medium completion	Degree completion is not high	No degree completion
Product design	Highest degree completion	High degree completion	Medium completion	Degree completion is not high	No degree completion

3.4 Suggest the performance test to the thesis supervisor. Check for accuracy and make improvements as suggested.

3.5 The performance test is handed over to 3 experts for measurement and evaluation. Check the content validity, find out the Index of Item Objective Congruence (IOC). The criteria for judging the consistency of the test are as follows:

Rating is +1. There is an opinion that "consistent to objective of leaning."

Rating is 0. There is an opinion that "Not sure it consistent to objective of leaning"

Rating is -1. There is an opinion that "Inconsistent with objective of leaning.

Each item test had an IOC consistency index greater than or equal to 0.50, so it was considered suitable for use in research. The result of the Index of Item Objective Congruence (IOC) analysis of this activity plan has an IOC = 1.00 for all questions.

3.6 Then take it to try out with students who were not a sample for 38 students to analyze the reliability of the performance test confidence values for the entire document are determined by Cronbach's Coefficient Alpha method = 0.70.

Data Collection

The data were collection analyzed as follows.

Experimental pattern

1. Coordinate with 3 professional scholars experts dispense official document from Rajabhat Bansomdejchaopraya University professional scholars experts and give information about data collection process and research tools: instructional model and checklist form about quality of instructional model for consideration (Index of Item Objective Consistency: IOC)

2. Collect data from 3 professional scholars experts and analysis data for consideration (Index of Objective Consistency: IOC)

3. This research is experimental research. One Group Pretest – Posttest design was used with the following experimental design:

Table 3.2 Experimental design

Group	Pretest	Experimental	Post test
R	O_1	X	O_2

The meaning of the symbols used in the experimental design.

R means Random Sampling

X means experimental

O_1 means Pretest

O_2 means Post test

This research was divided into 3 phases: 1. pre-experimental, 2. experimental, and 3. post-experimental. The details are as follows.

1. Pre-experiment phase

1.1 Contact with the Graduate School Bansomdejchaopraya Rajabhat University to request an official letter for an expert to inspect research equipment.

1.2 Organize an orientation before starting the experiment to understand students how to study student role learning objectives evaluation method and the benefits that will be gained from taking the ability test and learning activities during the experiment.

1.3 Test before teaching (Pretest) with fourth-year students in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023, the number of 38 people, which is a sample group, and check the score record in order to analyze the data.

2. Experiment phase

The experimental phase is the phase in which the sample group learns using the activity plan developed by the researchers based on the nondirective teaching theory. The teaching time in 4th July - 7th July total of 15 hours, not counting the days of pre-test and post-test, as follow table 3.3

Table 3.3 Training schedule for visual communication design abilities

Content/Date	Activity	time
Poster design 4th July	- Introduction - Basic knowledges, Design concepts and skills, Discussion - Hands-on process and practical exercises	1.30 hour
	Using nondirective teaching theory	
	1) Study	1 hour
	2) Discussion	30 minutes
	3) Thinking	30 minutes
	4) Planning creation	1 hour
	5) Summary analysis	30 minutes

Table 3.3 Training schedule for visual communication design abilities (continue)

Content/Date	Activity	time
Sign design 6th July	- Introduction - Basic knowledges, Design concepts and skills, Discussion - Hands-on process and practical exercises	1.30 hour
	Using nondirective teaching theory	
	1) Study	1 hour
	2) Discussion	30 minutes
	3) Thinking	30 minutes
	4) Planning creation	1 hour
	5) Summary analysis	30 minutes
Product design 7th July	- Introduction - Basic knowledges, Design concepts and skills, Discussion - Hands-on process and practical exercises	1.30 hour
	Using nondirective teaching theory	
	1) Study	1 hour
	2) Discussion	30 minutes
	3) Thinking	30 minutes
	4) Planning creation	1 hour
	5) Summary analysis	30 minutes

3. Post-experiment phase

The post-test period is to measure the visual communication design ability after using the nondirective teaching theory, as follows:

After all the content has been taught, a proficiency test is given to a sample group of students. Test after learning (Post-test), and then check and score according to the scoring standards formulated by the researcher. Once the scores have been reviewed and combined, the scores are submitted for further data analysis.

Data Analysis

1. The researchers analyzed the data. Using the Excel program, the order in which the data were analyzed was as follows:

1.1 Quantitative data were analyzed through descriptive statistics; means, and standard deviation.

1.2 Quantitative data were analyzed through inferential statistics; Then calculate the different score of learning ability before and after using instructional model were analyzed through t – test for dependent sample.

2. Statistics used to analyze data

The researcher has analyzed the data. as the following details:

2.1 Basic statistics include:

Average usage formula (Jia Junping, 2018, p39)

Formula $\bar{X} = \frac{\Sigma x}{n}$

$\bar{X}$ represents the average score

Σx represents the sum of all scores

n represents the number of students in the sample

The standard deviation (S, SD.) using the formula (Jia JunPing, 2018, p.45)

Formula $SD. = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$

where SD. represents the standard deviation

x_i represents each score

$\bar{X}$ represents the average score

n represents the number of students in the sample

2.2. Statistics for analyzing instrument quality, include:

Index of Item Objective Congruence: IOC of the learning management plan. multiple-choice test and performance test using the formula (Rovinelli & Hambleton, 1997, p.47-54) as follows.

Formula $IOC = \frac{\sum R}{N}$

Where IOC represents Item Objective Congruence

$\sum R$ represents sum of expert opinion scores

N represents total number of experts

2.3 Difficulty value of the item test

2.4 Discrimination power of the item test

2.5 The reliability of the multiple-choice test by the Kuder Richardson Method (KR-20) (Zach, 2022)

Formula $KR\_20 = \frac{K}{K-1}\left\{1 - \frac{\Sigma p_j q_j}{\sigma^2}\right\}$

K represents total number of questions

p_j represents proportion of individuals who answered correctly

q_j represents proportion of individuals who answered question j incorrectly

σ^2 represents score variance for all individuals who took the test

2.6 Statistics used in hypothesis testing

Statistics were used for t - test for dependent samples analysis using statistical package. (Jia Junpin, et al., 2018)

Formula $t = \frac{\Sigma(\bar{x}_1 - \bar{x}_2)}{\frac{s}{\sqrt{n}}}$

t represents student t-test

$\bar{x}_1 - \bar{x}_2$ represents Difference mean of pairs

s represents standard deviation

n represents sample size

Chapter 4
Results of Analysis

This research was to develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students and to compare students' visual communication design ability before and after training course based on nondirective teaching theory of undergraduate students. The data analysis result can be presented as follows:

1. Symbol and abbreviations
2. Results of data analysis

The details are as follows.

Symbol and Abbreviations

n represents the number of students

$\overline{X}$ represents the average

SD. represents the standard deviation.

D represents the difference in scores between before and after learning.

df represents degree of freedom

t represents the statistical value to be used in the T-test

Results of Data Analysis

Visual communication design ability, students can design theme, color, composition, graphics, text, and software proficiency and compare students' visual communication design abilities before and after a training course based on the theory of non-directive teaching. The researchers will present the results of the data analysis in the following content.

1. The development of training course based on nondirective teaching theory to improve the visual communication design ability of undergraduate students, the research has studied the documents and research related to nondirective teaching theory from many researchers: Rogers (1969); Maryam Hasan (2013); Lu Mingjuan (2019); Guan Xin (2020). In this research, the researcher has synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students. The data analysis was assessment of the quality of the activity plan according to nondirective teaching theory by 3 experts, the results are shown in table 4.1.

Table 4.1 Assessment of the quality of the poster design activity plan

Assessment Item	$\bar{X}$	SD.	Interpretation
Activity plan I: Poster design training course			
1. Learning objectives sort the contents from easy to difficult.	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability.	5.00	0.00	Most suitable
6. Learning activities linked from basic knowledge to learning from working independently in creative thinking.	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability.	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5.00	0.00	Most suitable
Total	**5.00**	**0.00**	**Most suitable**

From table 4.1 the assessment of the quality of the activity plan by experts. The suitability of the research objectives has the most suitable ($\bar{X}$=5.00, SD.=0.00). When considering the assessment item, it was found that it is the most suitable ($\bar{X}$=5.00, SD.=0.00) for every assessment item and can be used in teaching and it can be used for teaching.

Table 4.2 Assessment of the quality of the sign design activity plan

Assessment Item	$\bar{X}$	SD.	Interpretation
Activity plan II: Sign design training course			
1. Learning objectives sort the contents from easy to difficult.	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability.	5.00	0.00	Most suitable
6. Learning activities linked from basic knowledge to learning from working independently in creative thinking.	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability.	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5.00	0.00	Most suitable
Total	**5.00**	**0.00**	**Most suitable**

From table 4.2 the assessment of the quality of the activity plan by experts. The suitability of the research objectives has the most suitable ($\bar{X}$=5.00, SD.=0.00). When considering the assessment item, it was found that it is the most suitable ($\bar{X}$=5.00, SD.=0.00) for every assessment item and can be used in teaching and it can be used for teaching.

Table 4.3 Assessment of the quality of the product design activity plan

Assessment Item	$\bar{X}$	SD.	Interpretation
Activity plan III: Product design training course			
1. Learning objectives sort the contents from easy to difficult.	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability.	5.00	0.00	Most suitable
6. Learning activities linked from basic knowledge to learning from working independently in creative thinking.	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability.	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5.00	0.00	Most suitable
Total	**5.00**	**0.00**	**Most suitable**

From table 4.3 the assessment of the quality of the activity plan by experts. The suitability of the research objectives has the most suitable ($\bar{X}$=5.00, SD.=0.00). When considering the assessment item, it was found that it is the most suitable ($\bar{X}$=5.00, SD.=0.00) for every assessment item and can be used in teaching and it can be used for teaching.

2. The results of the comparison students' visual communication design ability before and after training course based on nondirective teaching theory of undergraduate students.

2.1 This research is carried out to development of nondirective teaching theory to improve the visual communication design ability of undergraduate students, the detail results of visual communication design ability score between before and after the nondirective teaching theory of undergraduate students were shown in table 4.4.

Table 4.4 Visual communication design ability score between before and after learning

Student	Pretest (71)	Posttest (71)	Difference scores (D)	Student	Pretest (71)	Posttest (71)	Difference scores (D)
1	38	61	23	20	32	58	26
2	41	62	21	21	43	66	23
3	37	60	23	22	38	61	23
4	39	63	24	23	39	58	19
5	37	65	28	24	39	62	23
6	40	60	20	25	44	60	16
7	43	60	17	26	38	57	19
8	37	61	24	27	38	63	25
9	32	59	27	28	40	61	21
10	37	63	26	29	41	62	21
11	38	61	23	30	33	60	27
12	37	61	24	31	43	63	20
13	37	63	26	32	40	61	21
14	38	63	25	33	40	62	22
15	38	62	24	34	34	62	28
16	36	58	22	35	32	60	28
17	41	62	21	36	36	60	24
18	37	61	24	37	37	59	22
19	38	64	26	38	35	58	23
				$\bar{X}$	37.97	61.10	23.13
				SD.	2.99	1.99	2.88

From table 4.4, the visual communication design ability scores before and after the nondirective teaching theory of the undergraduate students, the average score before learning was 37.97, the average score after learning was 61.10, and the mean difference was 23.13. The after-learning score was found to be higher than the before-learning score.

2.2 The comparison of students' visual communication design ability between and after learning by using the nondirective teaching theory of undergraduate students. The researcher used the visual communication design ability score between before and after learning to analyze the data using average statistics, standard deviation and t-test which the data analysis results are shown in Table 4.5

Table 4.5 The comparison of visual communication design ability score between before and after learning

Visual communication design Ability	Testing	n	Score total	$\bar{X}$	SD.	df	t	p
Poster design	Pre-test	38	24	11.89	1.09	37	38.07**	.00
	Post-test	38	24	18.50	0.98			
Sign design	Pre-test	38	24	10.95	0.89	37	33.53**	.00
	Post-test	38	24	18.37	0.59			
Product design	Pre-test	38	23	10.97	1.13	37	36.08**	.00
	Post-test	38	23	17.50	0.76			
Total	Pre-test	38	71	37.97	2.99	37	48.92**	.00
	Post-test	38	71	61.10	1.99			

**Statistically significant of the .01 level ($p<.01$)

From table 4.5, the comparison of students' visual communication design ability between before and after learning by using nondirective teaching theory of undergraduate students. The average score before learning was 37.97, the average score after learning was 61.10. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the .01 level. When considering the results of data analysis classified by content: poster design, sign design, and product design. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the level .01 for all contents.

Chapter 5
Conclusion Discussion and Recommendations

The purpose of this research was 1) to develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students and 2) to compare students' visual communication design ability before and after training course based on nondirective teaching theory. The sample group were 38 students of fine arts from fourth-year students of 1 class of Qingdao University, Qingdao city, China. Through the cluster random sampling method, in the second semester of the academic year 2023.

The research tools used in this study are as follows

1. To develop the nondirective teaching theory to design activity plans and conduct training to improve visual communication design ability of the students.

2. To create visual communication design ability test, which a multiple-choice test totally 41 items and performance test, totally 6 items to improve visual communication design ability of the students.

Conclusion

Visual communication design ability, students can design theme, color, composition, graphics, text, and software proficiency and compare students' visual communication design abilities before and after a training course based on the theory of non-directive teaching. The researchers will present the results of the data analysis in the following content.

1. The development of training course based on nondirective teaching theory to improve the visual communication design ability of undergrad students, the researchers has studied the documents and research related to nondirective teaching theory from many researchers and has synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students. The data analysis was the assessment of the quality of the activity plan according to nondirective teaching theory by 3 experts, and the results are shown the quality of the activity plan by experts; overall, the suitability of the research objective has the most suitable.

2. The comparison of students' visual communication design ability between before and after learning by using nondirective teaching theory of undergraduate students. The average score before learning was 37.97, the average score after learning was 61.10. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the .01 level. When considering the results of data analysis classified by content: poster design, sign design, and product design. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the level .01 for all contents.

Discussion

Research results on the development of visual communication design abilities 38 fourth-year students in fine arts major of the Qingdao University, Qingdao, China, in the second semester of the academic year 2023 by using nondirective teaching theory can be discussed as follows.

1. The development of training course based on nondirective teaching theory to improve the visual communication design ability of undergrad students. The research has studied the documents and research related to nondirective teaching theory from many researchers and has synthesized into 5 steps used to develop a activity plan according to the nondirective teaching theory of undergraduate students. The data analysis was the assessment of the quality of the activity plan according to the nondirective teaching theory by 3 experts, and the results are shown the quality of the activity plan by experts; overall, the suitability of the research objectives has the most suitable. This is because the developed learning plan is consistent with the concept of the nondirective teaching theory, and the developed activity plan contains critical elements of the activity plan. Learn completely related the content is clear and comprehensive. The activities that are established emphasize that learners can actually learn, practice thinking, and practice in terms of teaching media. In terms of measurement and evaluation is determined to be an assessment based on actual conditions and to measure according to the learning objectives and in determining the work piece and workload are appropriate in accordance with the learning objectives, which is consistent with the research Guo Shanshan (2020) and Huang Xuerong (2021), through the development of actual activity plan cases based on nondirective teaching theory to examine the student visual communication design outcomes of nondirective teaching theory that are fully applied to actual teaching. In addition, Rogers (1969) emphasis on learning based on

nondirective instruction is the standard for student-directed learning. In Lu Mingjuan (2019), the result shows that the nondirective teaching theory emphasizes that everyone has a natural tendency to healthy development, and that interpersonal relationships full of sincerity, trust and understanding will contribute to the stimulation of students' potential. The teaching process of nondirective teaching theory generally consists of 5 steps. In different literature, the development and implementation of nondirective teaching theory have further details.

2. The comparison of students' visual communication design ability between and after learning by using the nondirective teaching theory of undergraduate students. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the .01 level, which was in accordance with the hypothesis. The theory of nondirective teaching adheres to the student-centered teaching concept, advocates the meaningful free learning concept, promotes the self-realization of the teaching goal concept, and the equal and harmonious teacher-student concept. This is the same as Yin Xiaoling & Tang Zhongshun (2018). Meanwhile, this kind of teaching can not only expand students' thinking, stimulate students' interest in learning, but also fully play the main role of students from the perspective of students' psychology, so that students can continuously improve their design ability in the process of independent learning. The research concludes that "student-centered" is the main educational idea of nondirective teaching, and the study of nondirective teaching is to develop students in an all-round way under the guidance of modern educational concepts; this is consistent with Shi Wei (2012). As a result of the ordinary method to the first group, students' achievement grades increased by approximately 9 points; as a result of the nondirective teaching theory applied to the second group, students' achievement grades increased 23 points approximately, and the results show that nondirective teaching theory has a positive effect on students success and that choosing the proper teaching method suitable to students individual interests and abilities is very important.

In conclusion, this paper has shown that nondirective teaching theory can be used as an effective teaching strategy to create a student-centered learning environment in the visual communication design class. The principle of "nondirective" teaching emphasizes that students are the center and subject of the learning process, and teachers do not regard themselves as high-ranking instructors, but create conditions for students to learn as equals, trust students, promote a good learning atmosphere, create a safe, harmonious, sincere and open learning environment, and

ensure students' psychological freedom to fully think and research, feel the joy of learning, and think independently. As long as teachers adhere to practice and exploration, think and change while doing, classroom teaching will be rejuvenated. The article can conclude that nondirective teaching theory can help students clarify how to actively absorb knowledge in future learning, no longer passively absorbed, but transformed into interest. At the same time, the use of nondirective teaching theories can indeed improve students' visual communication design ability.

Recommendations

General recommendation

1. Some key concepts of nondirective teaching theory, such as personal potential, human goodness, self-actualization, etc., are still only based on a hypothesis and trust in people, lack of rigorous scientific evidence, and teaching goals expressed in these vague terms are often more empirical.

2. Nondirective teaching has the problem of taking up more time in actual teaching, because students need to learn independently, which is a severe test of students' visual communication design ability. Teachers should help students clarify the direction of learning, actively guide them in the classroom, and avoid students spending too much time on the road of figuring out how to learn.

3. In the nondirective teaching classroom, it is too difficult for teachers to teach, so teachers should cultivate their own teaching ability, starting from the most difficult points, so that students can more quickly and clearly understand the knowledge to be learned in this lesson.

Suggestions for further research

1. Sample selection when random sampling is used, the sample of students sampled is not representative of the parent being studied, which may cause problems related to statistical selectivity bias in the study.

2. Nondirective teaching theories are not commonly used in teaching today, so when conducting research, there is not enough literature related to the research topic. The literature may also be limited due to the different scope of the research topics.

3. Problems encountered in collecting data material, as the study was conducted for a specific person or group of organizations, so there were time constraints, such as ensuring that the research topic could be completed by the deadline; Because of the bias caused by personal factors, because the nondirective teaching test tests the student's independent visual communication design ability, the deviation caused by the face of personal claims may affect the rationality of the research, because

students have the ability to think independently. Therefore, it is necessary to check whether the data collection process is appropriate, and clarify the time required for the part of the course, if the course cannot be completed due to time limitations, you can practice more in future courses.

4. In the future, when using nondirective theories for teaching, whether it is short-term training or course teaching, it will put forward high requirements for teachers' knowledge. Because of the complexity of students' thinking, teachers need extremely high knowledge literacy to support the questions raised by students, so teachers must play a good role as a guide in the classroom.

5. This study addresses the inability of students to increase their interest in visual communication design classes in order to improve their design skills. However, due to the limited time in the research process, there are still many questions that need to be solved: for example, whether the knowledge students learn in the classroom can be applied to future design, and whether the teaching used in nondirective teaching for classes of different majors is different. For visual communication design, it is particularly important in the development of the future market, student-centered teaching can not only improve students' thinking ability, but also broaden students' horizons, improve their ability to learn actively, and better adapt to the needs of market development.

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Appendix

Appendix A
List of Specialists and Letters of Specialists invitation for IOC Verification

Expert name to validate a research instrument

1. Assistant Professor Dr.Krongthip Neamthanom
   Ph.D.Program in Research and Statistics in Cognitive Science

2. Assistant Professor Dr.Petchara Pipatsuntikul
   Ph.D.Program in Program in Educational Measurement and Evaluation

3. Professor Dr.Ma Yongjun
   Ed.D.Program in Curriculum and Teaching Theory

Appendix B
Official Letter

Ref.No. MHESI 0643.14/133

Bansomdejchaopraya
Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

25 April 2023

RE: Invitation to validate research instrument

Dear Assistant Professor Dr.Krongthip Neamthanom

Ms.Luo Sai is a graduate student in Master of Education Program in Curriculum and Instruction of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

We respectfully request your assistance in validating a research instrument that is attached to this message. We would be grateful for any help you can provide in this matter. We would like to express our sincere appreciation for your time and expertise. If you have any questions or concerns, please do not hesitate to contact Ms.Luo Sai at 1354803031@qq.com

Thank you for considering our request.

Sincerely,

Nainapas. I.

(Dr.Nainapas Injoungjirakit)
Vice Dean, For Dean of the Graduate School

Bansomdejchaopraya Rajabhat University
Tel.+662-473-7000 ext. 1814
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Ref.No. MHESI 0643.14/134

Bansomdejchaopraya
Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

25 April 2023

RE: Invitation to validate research instrument

Dear Assistant Professor Dr.Petchara Pipatsuntikul

Ms.Luo Sai is a graduate student in Master of Education Program in Curriculum and Instruction of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

We respectfully request your assistance in validating a research instrument that is attached to this message. We would be grateful for any help you can provide in this matter. We would like to express our sincere appreciation for your time and expertise. If you have any questions or concerns, please do not hesitate to contact Ms.Luo Sai at 1354803031@qq.com

Thank you for considering our request.

Sincerely,

Nainapas I.

(Dr.Nainapas Injoungjirakit)
Vice Dean, For Dean of the Graduate School

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Ref.No. MHESI 0643.14/135

Bansomdejchaopraya
Rajabhat University
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25 April 2023

RE: Invitation to validate research instrument

Dear Professor Dr.Ma Yongjun

Ms.Luo Sai is a graduate student in Master of Education Program in Curriculum and Instruction of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

We respectfully request your assistance in validating a research instrument that is attached to this message. We would be grateful for any help you can provide in this matter. We would like to express our sincere appreciation for your time and expertise. If you have any questions or concerns, please do not hesitate to contact Ms.Luo Sai at 1354803031@qq.com

Thank you for considering our request.

Sincerely,

Nainapas I.

(Dr.Nainapas Injoungjirakit)
Vice Dean, For Dean of the Graduate School

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Appendix C
Visual Communication Training Course

Information Sheet 1
Poster Design

Poster Design: Posters are an art of information transmission and a popular publicity tool. A good poster design can play the promotional role that a poster should have. It can quickly attract the attention of others, properly display the promotional information of the business, and thus play a role. important role in promotion. A pair of posters can not only enhance the marketing power of brand image planning, but also allow more people to understand the charm of the brand image, and at the same time enable the company to get more highlights and attract attention with eye-catching images.

STEP 1

The course begins with an explanation of the definition and origin of poster design: Poster is an art of information transmission and a popular propaganda tool. Posters are also known as posters. It is a large-scale painting plastered on the street wall and hung in the window, attracting the attention of passers-by with its striking pictures, and the 20th century was in a sense the century of political propaganda, and posters reached their peak as a propaganda method at that time.

The general requirement of poster design is to make people clear at a glance. General posters usually contain notice, so the theme should be clear and conspicuous, and then summarize the main content such as time, place, notes, etc. in the most concise sentences. Poster illustrations, beautiful layouts are often a good way to catch the eye. In real life, there are more abstract and concrete.

Poster design is mainly divided into: commercial posters (commercial advertising posters promoting goods or commercial services), cultural posters (publicity posters for various social and cultural activities and various exhibitions), movie posters (attracting the attention of the audience and stimulating film box office revenue), public welfare posters (with certain ideology and specific educational significance to the public).

STEP 2

Then the teacher will lead the students to analyze some excellent design cases, and the teacher will talk about the excellent design parts of the case and whether it is suitable for the current design environment. Students can independently discuss and analyze, give examples of advantages and disadvantages in cases, and think about the common points of this type of design.

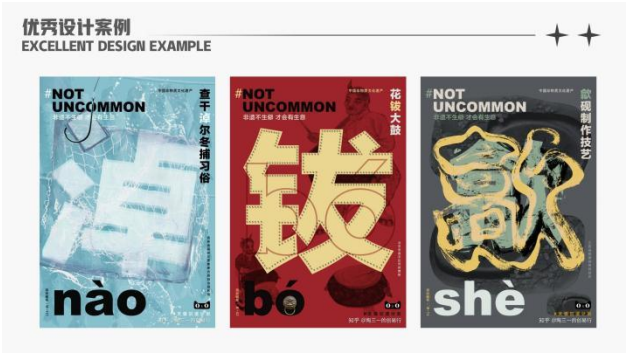
1. The poster collected by MUJI is a more classic design in the history of the brand, implementing the simple, simple and return to nature design lifestyle advocated by MUJI. The entire poster has no pattern except for the red circle held by the hand in the middle, but usesexquisite text typography to decorate the entire picture. The seemingly empty picture produces the effect of "making something out of nothing", and the whole picture presents a visual experience of large blank space. From this poster, it is not difficult for students to see that the minimalist style has been emerging from the Eastern world since the 80s, always implementing the most natural and simple design concepts.

2. The work is called "Time to Spend with the Family", and the golden wheat field can express the warmth of the family, and at the same time, the use of characters as the main object can highlight the theme of the poster.

3. The work is called "Portugal also has MUJI". It was a poster for MUJI when it opened its first store in Portugal. The gesture of "natural color" exclusive to MUJI with characters dressed in traditional Portuguese forms is one of the foundations of MUJI.

"MUJI" in Japanese means a good product without a brand sign, that is, there is no brand sign in packaging and product design. Although it tries to dilute the brand's awareness, the products produced by it following the unified design concept all interpret the brand image of "MUJI". It is a representative of the "aesthetics of Zen" in Japanese design, as well as the minimalist aesthetic design style. The designer of the MUJI poster: Kazumitsu Tanaka, the extraction of elements is his characteristic, and his style is to lay out a picture as a whole with simple blocks and a single color.

This group is the poster design of Red Star Macalline 2020 Luban Sharp Goods Festival, which uses oil painting style illustration design techniques in the poster. Furniture design works from different countries have an exclusive poster, with the unique representative buildings of each country as the main picture, and then accompanied by the design works of each country as auxiliary graphics, giving people a refreshing and intuitive feeling. This event design breaks the previous industry model and creates a new visual skyline.



This group of posters is the "Tmall Heritage Recognition Project Posters", which are themed on the rare characters in the names of China's intangible cultural heritage, incorporating elements of intangible cultural heritage itself, and are rich in color but not frivolous; The copywriting "If intangible cultural heritage is not secluded, there will be life", catchy and concise. In line with the design principle of "words are like people, words are like intangible cultural heritage", the designer added more elements of intangible cultural heritage to the poster, "We will extract outstanding blocks from intangible cultural heritage and let the art do the color matching." Distinctive elements were also sought from intangible cultural heritage and designed as poster backgrounds. "In order to make the design more textured and unique, many posters are handmade.

STEP 3

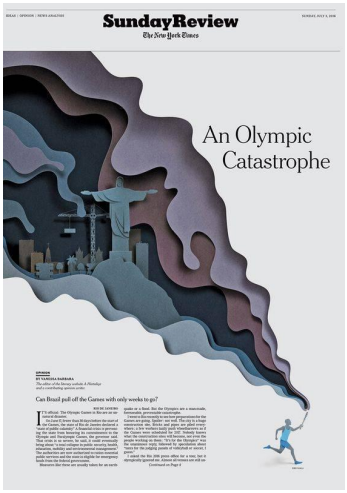
The next part of the teacher will tell students how to use the photoshop to make posters, and what shortcuts exist in the software, which can not only help students become familiar with the software faster, but also shorten the time for students to make software, and focus more on ideas and creation.

Students first need to know about PS: Adobe Photoshop, or PS for short, is an image processing software developed and distributed by Adobe Systems. Photoshop deals primarily with digital images made up of pixels. With its numerous editing and drawing tools, you can effectively edit and create pictures. PS There are many features, which are covered in various aspects such as images, graphics, text, video, publishing, etc.

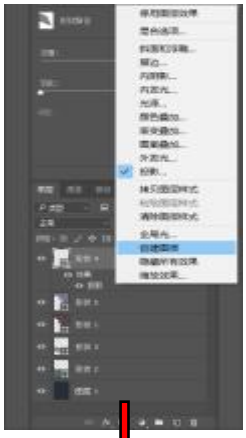
Next, the teacher will teach students how to make basic posters with PS:

In the absence of materials, the production of a poster can be drawn with a pen, the process is somewhat tedious, but you can master the design process yourself; When you have the material in hand, you only need to simply piece it together to produce a complete poster work.

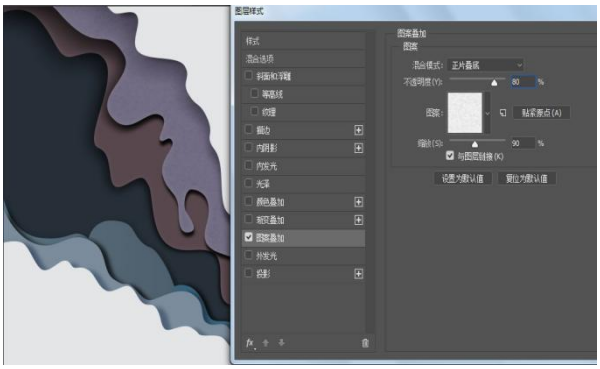
FOR EXAMPLE:



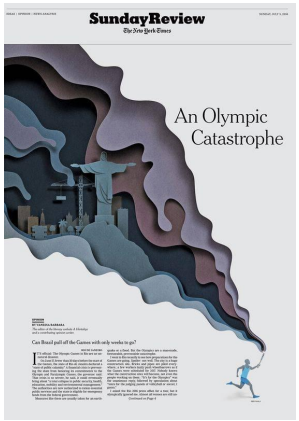
1) Shadows are then added separately for each layer, which can be added using the drop shadow in the layer style.



2) But the drop shadow effect is slightly unnatural, and after we create a new layer of drop shadow effect, we can adjust the shadow effect using the blur filter in the filter, the tilt-shift blur. The same is true for other layers, after the drop shadow effect is created, the transparency can be adjusted according to the desired effect of the shadow, the blending mode, or you can use a brush or eraser to add or remove shadows, after adjusting as shown above.



3) Then use layer styles - pattern overlays - to enhance the texture of the paper. Select Pattern Overlay in the layer style.



4) Finally, add text and you're done. layer style.

Then, the teacher will teach students shortcuts exist in the software:

Direct selection tool: [A] Brush Tool: [B]

Straw, color sampler: [I] Pen, free fountain pen, magnetic fountain pen: [P]

Paint bucket tool: [K] Measurement tool: [U]

Default foreground and background colors: [D]

Text, vertical text, vertical text mask: [T]

Use the Hand Tool: [Space] Hand tool: [H]

Toggle foreground and background colors: [X]

Radial gradient, degree gradient, diamond gradient: [G]

Tool Options Panel: [Tab] Zoom tool: [Z]

Rectangle and ellipse marquee tools: [M]

Lasso, polygonal lasso, magnetic lasso: [L]

Eraser tool: [E] Cropping tool: [C]

Imitation stamps, pattern stamps: [S]

Brush repair tool, repair tool: [J]

Add Anchor Tool: [+] Move tool: [V]

History Brush Tool: [Y] Blur, sharpen, smudge tools: [R]

Delete Anchor Tool: [-] Magic Wand Tool: [W]

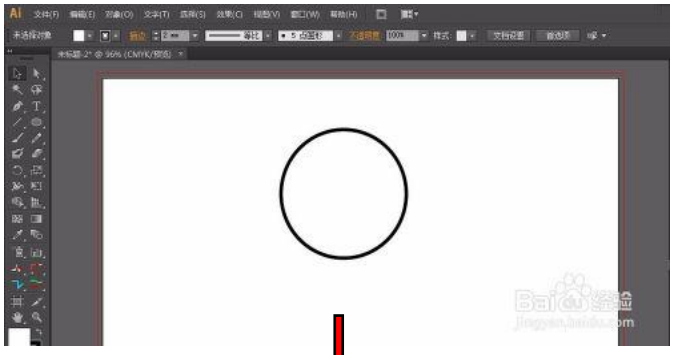
Pencil, Line Tool: [N] Dodge, Deepen, Sponge Tool: [O]

Students first need to know about AI: Adobe illustrator, or AI for short, is an industry-standard vector illustration software for publishing, multimedia, and online images. AI is a software that specializes in vector editing, which is created from 0 to 100, and belongs to the kind of creation that hardly requires ready-made materials.

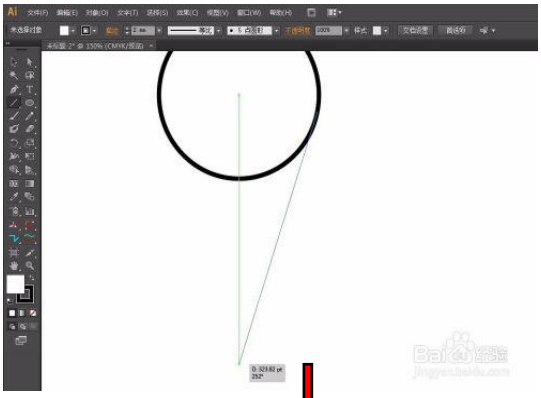
Next, the teacher will teach students how to make basic posters with AI:

Because AI is a vector drawing software, it is more convenient to use pure hand-drawn if it is used to make posters, unlike PS, which is good at bitmap editing, which uses ready-made materials for secondary processing and editing.

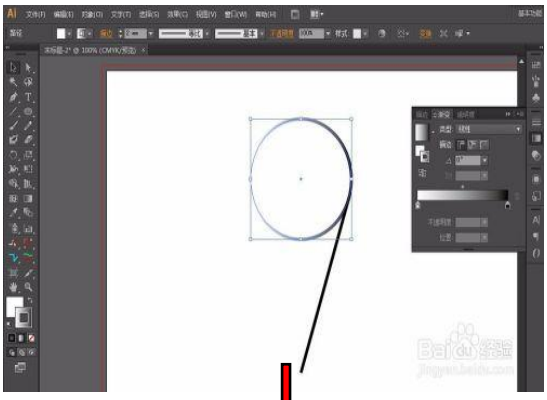
FOR EXAMPLE:



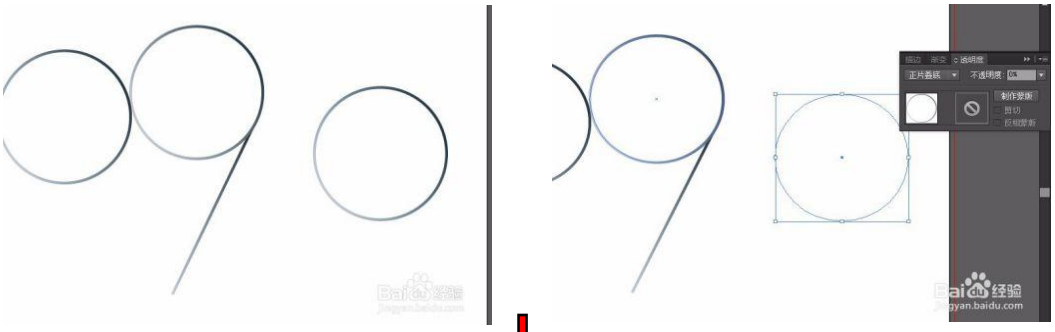
1) Start by drawing a circle with AI.



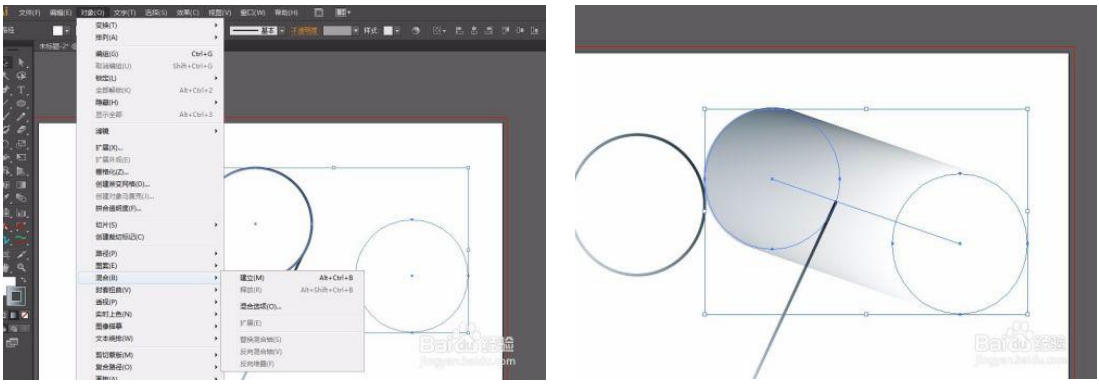
2) Draw a straight line along the tangent of the circle, the thickness of the line is the same as the circle.



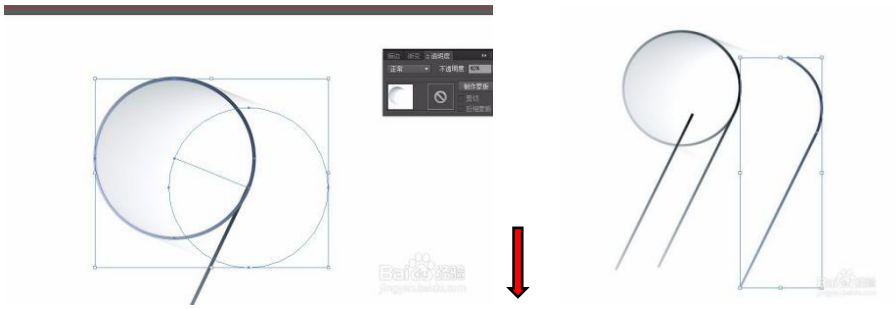
3) Then give the stroke of the circle a gradient, and the color value can be given by itself, which is basically a transition from light to dark color with low saturation.



4) Make a copy of the circles, duplicate two circles, two of which are used to make a projection and one to cover the top. Then adjust the circle you copied to the projection direction, change the transparency to 0%, and change the blend mode to "Multiply".



5) Select the two circles, execute the "Object" - "Blend" - "Blend Options" command, change the specified distance to 1 (the value is as small as possible), and then use "Ctrl+Alt+B" to execute the blend command. The effect is shown in the figure:



6) Adjust the position of the transparent circle, reduce the transparency of the blend, and place another circle on the top. Duplicate a line segment and use the Pen tool to supplement the segment along the tangent of the shadow. Copy the supplemented segments.

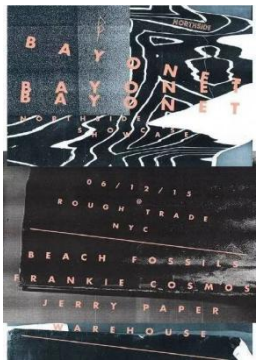
7) Then there's the circle-like operation.

8) PS Create a new layer and use different colored brushes to highlight the highlight. Execute the overlay command on the layer, duplicating an additional layer if necessary. Next, add text and give a background color.

Then, the teacher will teach students shortcuts exist in the software:
Direct selection tool: [A] Brush Tool: [B]
Straw, color sampler: [I] Pen, free fountain pen, magnetic fountain pen: [P]
Paint bucket tool: [K] Measurement tool: [U]
Default foreground and background colors: [D]
Text, vertical text, vertical text mask: [T]
Use the Hand Tool [Space] Hand tool:[H]
Toggle foreground and background colors: [X]
Radial gradient, degree gradient, diamond gradient: [G]
Tool Options Panel: [Tab] Zoom tool: [Z]
Rectangle and ellipse marquee tools: [M]
Lasso, polygonal lasso, magnetic lasso: [L]
Eraser tool: [E] Cropping tool: [C]
Imitation stamps, pattern stamps: [S]
Brush repair tool, repair tool: [J] Add Anchor Tool: [+]
Move tool: [V] History Brush Tool: [Y]
Blur, sharpen, smudge tools: [R] Delete Anchor Tool: [-]
Magic Wand Tool: [W] Pencil, Line Tool: [N]
Dodge, Deepen, Sponge Tool: [O]

STEP 4

In this part of the course content, teachers will teach students the design methods commonly used in poster design, as well as the characteristics of each method and the types of posters that are applicable. In this chapter, students can make up for the missing parts of the design methods and learn more about the types of poster design methods.



1) By splitting and reorganizing fonts, changing font size, and typography, it has the effect of attracting attention.

2) The poster design rule of graphic superposition is mostly used for movie posters, superimposing characters or scenes with text to create a visual sense of repetition.

3) The poster design of the fault effect usually uses the main visual graphic or text of the design to be presented in the form of phantom, distortion, overlapping and superposition, which can quickly attract people's eyes.

4) Text poster design contains many forms of expression, using full plate, white space, S-shaped and other typography forms to layout the picture, so that text instead of graphics to express the main picture.

5) The design of the liquid effect poster usually chooses to use a richer color for gradient, Gaussian blur or distortion to present, and the visual of the picture is mostly presented in abstract concepts.

6) The highlight of the positive and negative poster design is the use of negative space to form a clever composition. One picture hides another. Most designers will use negative space, focusing the visual center on a relatively small object and leaving room for visual breathing around it. Place text in negative space to draw attention.

STEP 5

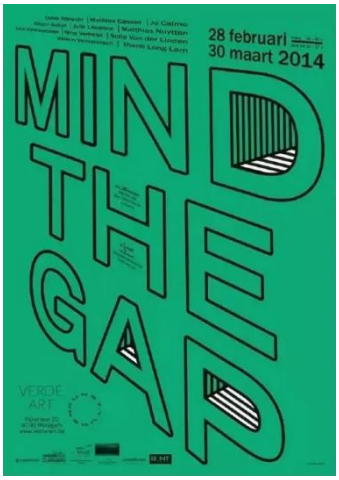
In this part of the course, teachers will teach students the design styles that often appear in poster design, and which scene each style feature applies to. In this chapter, students can make up for the recognition of design style, and through the understanding of design methods and styles, students are not only limited to creating in order to complete tasks, but also add more understanding and perceptual colors to the theme of creation.

Some students do not understand the content of this chapter well enough, because they are limited to learning to use software to make posters, and ignore the design and conception part. After listening to the teacher's popularization of knowledge, students should actively express their own opinions on each design method and style, and choose the creative method within their own ability.

1) Text-only minimalist style poster

Minimalist posters generally have a lot of white space, whether it is copywriting or patterns are very streamlined, giving people a natural and relaxed, generous and simple, this style is pleasing to the eye, more people linger, simplicity does not mean simple.

We see two letters dropped below, a and v, and we put these two letters back into the upper english vacant position, combining them into a complete because gravity, and then look at the english don't let go below. we mainly analyze the artistic conception of the theme text and picture here, the letters a and v seem to be affected by the earth's gravity, deviating from the overall english gravity, the following english don't let go, also just interprets the explanation of the letter av, we all know that the earth revolves around the sun, the top luminous place represents the sun, and the bottom represents the earth, so the letter AV is attracted by the earth's gravity to move down the vision, it can be said that this minimalist poster design is very perfect, Perfect interpretation of the artistic conception that the copywriter wants to express, here we will explain so much, want to design a minimalist and meaningful poster, the first step is of course to understand the meaning of the copy, and understand the purpose of designing this poster, and then through the meaning of the copywriting, we can use the artistic conception or graphics to express this sentence and the purpose we want to express.

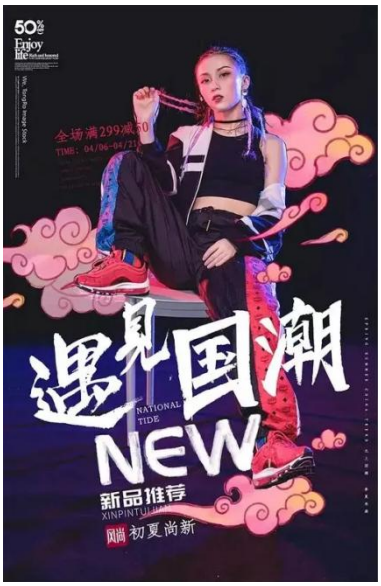


2) Text + graphic space poster: The application of space/perspective/stereoscopic style in posters is also very common, mainly using text and surface graphics, through chiaroscuro and position/angle changes, the text and surfaces are typeset in the canvas to create a perspective effect and spatial visual effect. As shown in the figure, the above 4 posters are designed a picture with a strong sense of space through the change of the position angle of the text and surface graphics, such a design method breaks the conventional rigid design picture, creates a new visual effect, makes the sense of picture more intense, but also makes the user have the desire to appreciate the entire space picture, more involving, this design method is also mostly used for pure text no picture no product poster design

3) Memphis style poster: The design of Memphis style posters try to express a variety of personalized cultural connotations, from naïve funny to grotesque, bizarre and other different tastes, often deliberately breaking the color matching law in color, like to use some bright, funny, high chroma bright colors, especially pink, pink green and other vulgar colors. Unlike traditional design, which emphasizes order, Memphis design likes to use messy and free combinations, and various geometric patterns are one of Memphis' classic elements, mainly squares, circles or triangles. You can see that the biggest feature of the design of Memphis posters is the use of our common geometric figures as design elements, the most used is circles, squares, triangles and add some line decoration, small dots of decoration is the most commonly used, often used for background decoration, so that the picture is richer, the color is also more use of vibrant colors, less copywriting.

4) Pop style poster: Pop style is a popular style, it was born in Britain in the mid-50s of the 20th century as an artistic expression, also known as "neo-realism" and "neo-Dadaism", which opposes all nihilistic ideas and expresses a real realism by creating those exaggerated, visually sensitive images that are more typical than real life. The main form of expression of pop art is graphics. It has the following features:

1. Pursue popular and popular fun, emphasize novelty and uniqueness in the design, and use strong color processing. These designs are all game-over, have a cynical adolescent psychology, like pop songs, with their flexibility and consumability out of the UK, and then form a worldwide design movement. 2. From the design point of view, Pop style is not a simple, consistent style, but a mixture of various styles, he pursues popular taste, opposes the pretentious purity of modernism, emphasizes novelty and uniqueness in design, and boldly adopts vulgar colors. 3. The pursuit of novelty, the pursuit of eccentricity, the pursuit of strangeness, the characteristics of the "spectrum" design style are fickle, and it is difficult to determine a unified style. It can be said that it is a variety of eclectic characteristics, and it is considered a formalist design style.



5) "National tide" has become the new favorite of young people's fashion culture, more and more young people will "national tide" as a new form of pursuit of self-expression and fashion attitude, a "national tide storm" quietly blowing, has become a force to be reckoned with, and gradually broke the previous beauty tide, daily tide long-dominated world trend pattern. The national chao style also has a Chinese style charm, but compared with the traditional Chinese style, the national chao style is more fashionable, more in line with young and fashionable people, and it is also bolder in typographical colors.

Assignment Sheet 1

Poster Design

Clarification

Students discuss the reasons for the emergence of poster design styles and how to choose a design style that suits them. At the same time, they integrate the basic knowledge they have learned that can be applied to their own design concepts. Finally, they complete the complete knowledge structure through the supplement of basic knowledge by other students.

Assignment Sheet 2

Poster Design

Clarification

Students determine their own design theme and style, which software to use for design, and choose what they are good at and like. At the same time, students can draw design sketches to discuss with the teacher.

Assignment Sheet 3

Poster Design

Clarification

Students start creating after determining the theme, using PS or AI to create for one hour. After completing the creation, they need to submit it to the teacher for comments and mutual evaluation.

Information Sheet 2
Sign Design

Sign Design: For corporate identity systems, the sign is the face of the company and the best way to distinguish it from competitors. The reason why an enterprise has strong strength, perfect management and high-quality products and services should be attributed to the company's sign design. Therefore, the company sign is very important for the company itself. The sign design represents the company's operating philosophy, cultural characteristics, value orientation, reflects the company's industrial characteristics, operation ideas, and is a detailed symbol of the company's spirit. Under the market economy system, the competition continues to intensify, the masses face a variety of complex information, and there are countless signs and trademark symbols, as long as the characteristics are obvious, simple identification and recall, deep meaning, beautiful appearance of the symbol, can be highlighted in the industry. It can differentiate itself from other companies, goods or services, make a deep impression on the company, and then increase the importance of sign planning.

STEP 1

The course begins with an explanation of the definition and origin of sign design: The sign is the core part of the brand image, which is the identification symbol that indicates the characteristics of things. It uses simple, conspicuous and easily recognizable images, graphics or text symbols as an intuitive language, in addition to what to represent and replace, it also has the role of expressing meaning, emotion and command action.

Sign design is not only the design of practical objects, but also the design of graphic art. The concrete things, events, scenes and abstract spirit, concepts, and directions are fixed through special graphics, so that people can naturally associate with the sign while seeing the sign, so as to identify with the enterprise. Sign design is closely related to the operation of enterprises, and trademark design is an indispensable element of daily business activities, advertising and cultural construction. And then the teacher will tell students about the common warm and cold colors in sign design and the basic steps of sign design, and students will have a preliminary understanding of the use of color in sign design. Common cool colors in sign design are: blue, white, cyan, purple.

Cool colors often conjure up cool climates, winter, death, sadness, ice, night, and water. Cool colors can give a feeling of calm, tranquility, newcomer, clean. Purple is often associated with prestige and looks very restrained. Common warm colors: red, orange, yellow. Warm colors can create feelings of warmth, and warm colors are often reminiscent of the sun, flame, and love. Red is the color of blood and feels warm, and orange and yellow give a summer feeling. Add an orange filter to the image, and the image will look warm and happy. There are the following steps in the sign design process: 1. Market research 2. Design conception 3. Sketching 4. Accurate drawing 5. Color matching 6. Post-application

STEP 2

Then the teacher will lead the students to analyze some excellent design cases, and the teacher will talk about the excellent design parts of the case and whether it is suitable for the current design environment. Students can independently discuss and analyze, give examples of advantages and disadvantages in cases, and think about the common points of this type of design.

1)Kyoto Nianciling's brand sign is called "Filial Piety Picture", which depicts the touching scene of the brand's founder serving his sick mother, with a strong national style element, and the name "Nianciling" comes from this filial mother story. With an excellent reputation all over the world, the "Kyoto Nianciling" brand has become synonymous with "high-quality Chinese medicine".

2)The shape of the Peking University emblem designed by Lu Xun is a traditional Chinese wadang image, and the simple silhouette gives people a modern feel. The upper "North" character is two figures standing back to back, and the lower "big" character is a frontal standing portrait, like one person carrying two people, constituting the image of "three people in a crowd", giving people the imagination of "Peking University people shouldering the heavy task of opening up the wisdom of the people". The coat of arms is composed in the format of a Chinese seal, and the word "Peking University" also has the symbolic meaning of "backbone". Lu Xun used the words "Peking University" to make an image

backbone, hoping that Peking University graduates will become the backbone of national democracy and progress.

3) The Douyin sign integrates the initial "D" of the brand name with the note elements in the staves, and reflects the dynamic gesture of "Jitter" through the misalignment of colors. It is said that the Douyin sign design is one of the frames captured in the shaky video after simulating the interference of radio waves. Then strengthen the attributes of the video industry through red and blue primary colors, and maximize the integration of "jitter" into the user's visual sense, so as to establish the user's association effect on the brand.

4) The China Post sign is a combination of the character "Chinese" and the image of the postal network; And in it incorporates the shape of wings, reminiscent of the ancient Chinese image metaphor for information transmission, "Hongyan Chuanshu", expressing the corporate purpose of serving thousands of households, as well as the corporate image of fast, accurate, safe and ubiquitous. China Post uses green as the exclusive color for the sign, symbolizing peace, youth, luxuriance and prosperity.

STEP 3

The next part of the teacher will tell students how to use the Adobe illustrator to make sign, and what shortcuts exist in the software, which can not only help students become familiar with the software faster, but also shorten the time for students to make software, and focus more on ideas and creation.

Because students have already learned about Adobe illustrator in the poster design course, this section no longer explains the term AI software.

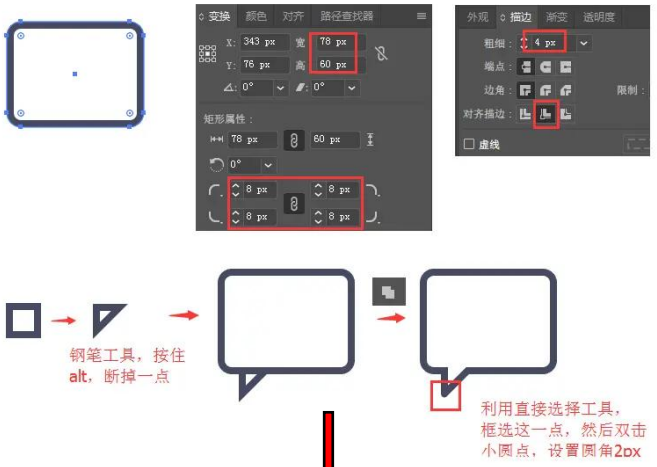
Next, the teacher will teach students how to make basic sign with AI:

Compared with using AI to make posters, the production of signs is a little better. Students need to draw a draft first, and then import it into the AI as the bottom layer, so that they will not deviate from the route when using the pen tool to draw.Because the final image exported from the logo design is vector art, and the

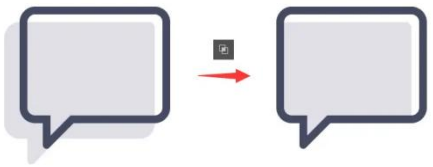
audience is exposed to a narrower line of sight than the poster, students are required to be very careful in the drawing process.

FOR EXAMPLE:

1) Create a new 800*600px canvas.



2) With the rectangle tool, draw a rounded rectangle with 78*60px, inner stroke 4px, and rounded corners 8px, fill color #fffff, stroke color #454a62. Draw another 20*20px rectangle, and use the suction pen tool to suck the rounded rectangle just made, as shown in the figure.



3) Then outline the stroke Ctrl+W, right-click to cancel the grouping, and then copy the fill layer Ctrl+C and Ctrl+F twice, change the color of a layer to #E0E0E6, offset the lower left corner by a distance, set the rounded corner in the upper right corner to 3px, and finally select the two layers just copied to intersect, as shown in the figure.

4) Right-click-transform-symmetry, copy the above figure, and then change the fill color value, the outer color value #ffbd69, the inner layer color #ffd67c, the position of the outer layer is adjusted with the direct selection tool. As shown in the

5) Draw one 54px and two 14px lines with the Line tool, stroke 4px, color value #454a62, and put them 12px apart. Then group the three lines, duplicate one layer, offset 1px down, and change the color value to #cfd1d3. As shown in the picture.

6) Draw two 8*8px circles and a 42*42px circle with a stroke of 4px, color value #454a62, and use the scissors tool to crop the rings with the laying aid. Then group them and contour the stroke, duplicate a layer offset 1px down, and change the color value #daa668. Finally, select all CTRL+G groups, as shown in the figure.picture.

Then, the teacher will teach students shortcuts exist in the software:

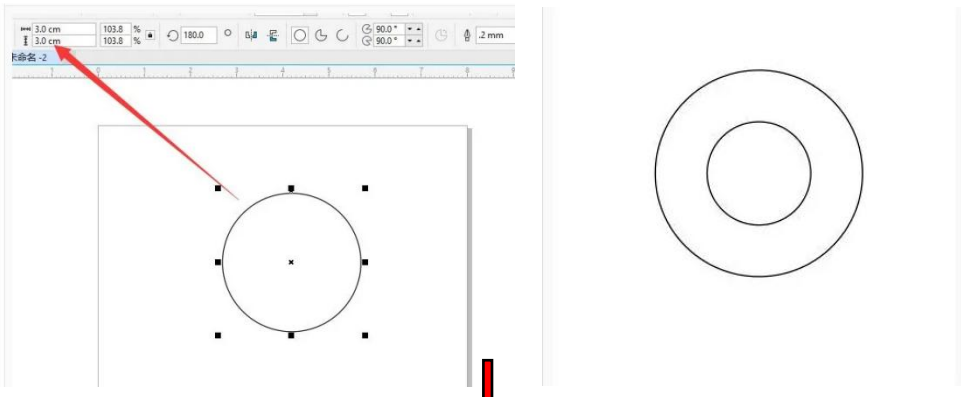
Standard Screen Mode, Full Screen Mode with Menu Bar, Full Screen Mode [F]
Switch to color fill [<] Switch to gradient fill [>]
Switch to no fill [/] Temporarily use the Hand Tool [Space]
Copy the object in [R], [O], [V], etc., press [Alt] + [Drag]
File Operation Create a new drawing file [Ctrl] + [N]
Open an existing image [Ctrl] + [O] Close the current image [Ctrl] + [W]
Save the current image [Ctrl] + [S] Delete selected object [DEL]
Select all objects [Ctrl] + [A] Deselect [Ctrl]+[Shift]+[A]
Convert [Ctrl] + [D] again Send to the front [Ctrl] + [Shift] + []]
Send [Ctrl] + []] forward Send to the last [Ctrl] + [Shift] + [[]
Send [Ctrl] + [[] backwards Group selected object [Ctrl] + [G]
Ungroup the selected object [Ctrl] + [Shift] + [G]

Lock the selected object [Ctrl] + [2]
Lock objects with no selection [Ctrl] + [Alt] + [Shift] + [2]
Unlock All [Ctrl]+[Alt]+[2]

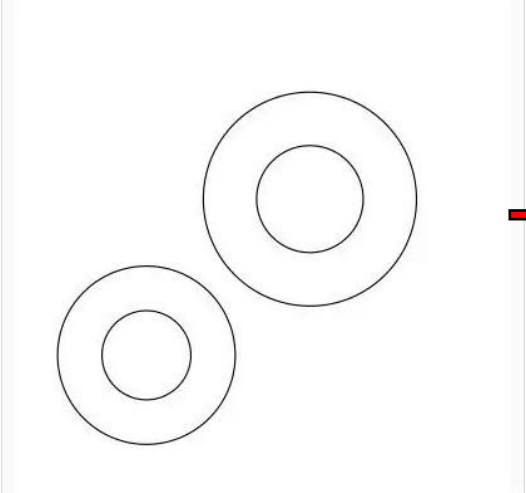
Students first need to know about CDR: CorelDRAW is an award-winning graphics and image editing software that includes two drawing applications: one for vector graphics and page design, and one for image editing. This combination of drawing software gives users powerful, interactive tools that allow them to create a variety of dynamic special effects and dot matrix image instant effects in a simple operation – without losing their current work.

Next, the teacher will teach students how to make basic posters with CDR:

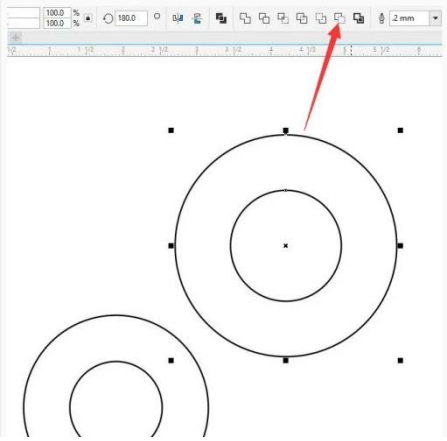
Compared with CDR, AI is more accurate, and the color and artistic sense are stronger. CDR is easier to use, similar to CAD, suitable for large advertising painting, etc. AI is mainly used abroad, and in recent years, domestic companies have also begun to popularize requirements, and CDR will be more commonly used in China. The advantage of AI is that it is much stronger than CDR in production and painting, and secondly, its layer mode is the same as PS, which is quite easy to use. CDR is suitable for novices, easy to get started, simple to operate, suitable for typesetting and printing. The disadvantage of AI is that the modification of the path is more troublesome, the typesetting function is relatively weak, and it is not suitable for inhuman drawing design such as mixed graphics and text, super large image design, mask opacity, gradient fill, etc.

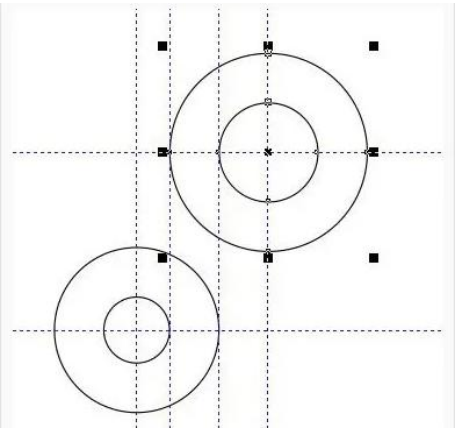


1) Create a new square canvas of any size. Draw a 3cm*3cm circle, and then copy one in place to modify the size of 1.5cm*1.5cm, you will get the following effect.

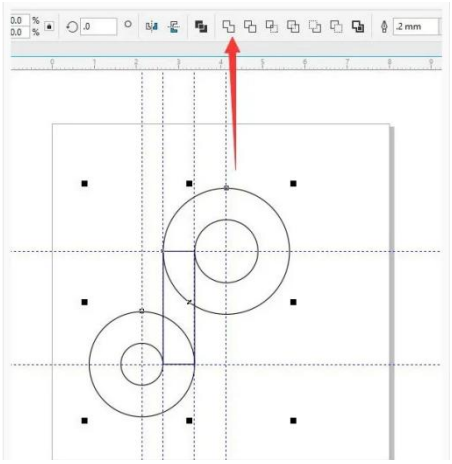


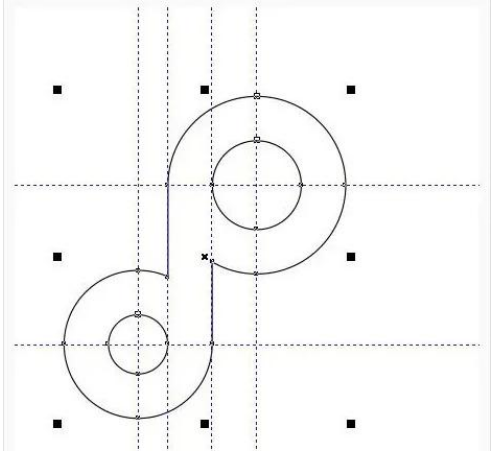
2) Then draw a 2.5cm*2.5cm circle, and then copy a selected selection to modify the size of 1cm*1cm, you will get the following effect.Why change it to 1cm is because the distance between the upper and lower circles and the distance between the lines behind it should be the same width.



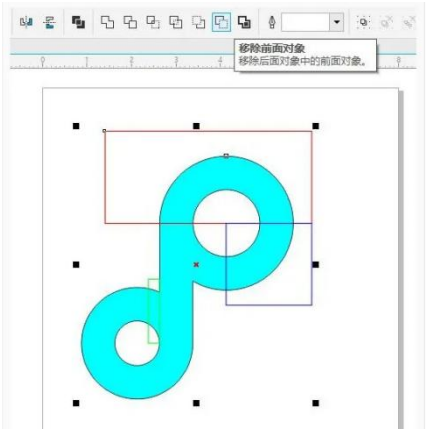


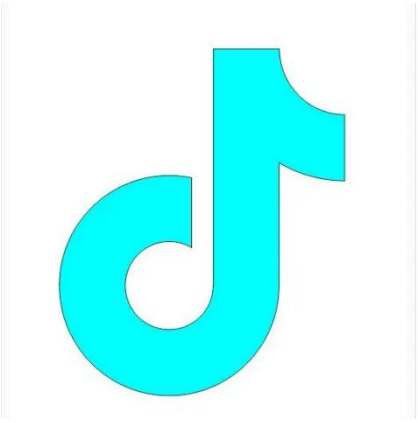
3) Select two circles and click the "Remove Front Object" button, the other two circles do the same. Then it is necessary to align the reference lines according to the position on the figure.





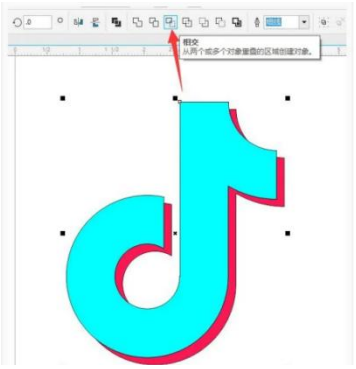
4) Use the "Rectangle Tool" against the reference point, then draw a rectangle connecting the upper and lower circles, and finally select all the shapes and click "Merge" The effect is as follows.



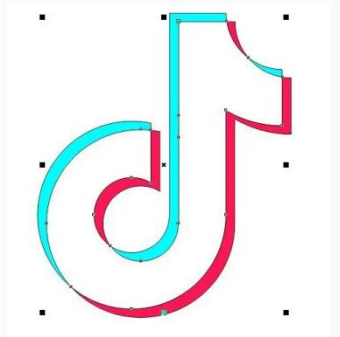


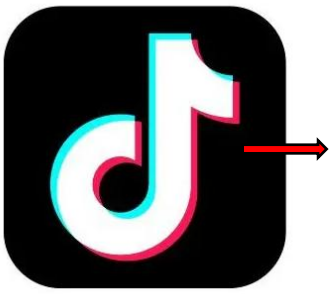
5) First add color to the merged semi-finished logo so that it can be better distinguished, color values: R0, G255, B255. Then select the rectangle and logo of the first crop area first, then click Remove the front object, and the following blue-green crop area will be operated in the same step.

6) Make a copy of a graphic and position it in place. The color value of the previous layer does not change. After the graphic color value is modified to fill to: R255, G24, B84.



7) Select the two graphs and click "Intersect", then select the top layer shortcut "shift+PgDn" to move back one level.





Select the intersecting areas where the graphic is filled with solid white, and then check all the shapes without borders. First "Ctrl+g group all graphics, then draw a 5cm*5cm histogram, fill it with black, and finally adjust the four corner rounded values to 1cm, press the English p key to play the black basemap to the middle of the canvas, and then center the logo to the middle of the black background, and finally complete.

Then, the teacher will teach students shortcuts exist in the software:

[F9] Full screen preview [Ctrl+W] Refresh

[Shift+F9] View [Ctrl+Enter] Toggles the attribute column

[PgUp] Displays the previous page in a multi-page file

[PgDn] displays the next page in the multi-page file, or inserts a new page

[Y] Polygon tool [F8] Text tool

[F6] Rectangle tool [F7] Ellipse tool

[F10] Shaping tools [F5] Last curve tool

[Ctrl+Space] Toggles the selection tool

[F2] Zoom in [F3] Zoom out

[H] Pan tool [Alt+ ↓] pans down

[Alt+ ↑] Pan up [Alt+→] Pan to the right

[Alt+←] Pan to the left [F4] Zoom in on all objects

[Shift+F4] Zoom in to the page

[Shift+F2] Zoom in on the selected object

[Ctrl+F2] Open View Administrator

STEP 4

In this part of the course content, teachers will teach students the design methods commonly used in sign design, as well as the characteristics of each method and the types of signs that are applicable. In this chapter, students can make up for the missing parts of the design methods and learn more about the types of sign design methods.

1) Cartoon technique: often in the form of painting to express the performance of cartoon logo, widely used, often used in catering, clothing, film, medicine and other industries. The use of cartoons can reflect anthropomorphism, storytelling, kindness, etc., such as Grandpa KFC with the attributes of being cordial and approachable. Generally speaking, it is necessary to master a certain hand-drawn foundation, because cartoons need to express perspective, light and shadow, etc., and need to be combined with hand-drawn to express.

2) Initials are a more commonly used method, the entry point is simple and easy to start, but if you want to design a logo, you still have to find a creative combination point, which can be combined with other expression techniques, otherwise it is too simple, and there is no sense of design. The design method of the first letter is not to let everyone directly take out the initial letter as a logo, but to combine creative points to cut into, such as the combination of the letter B in the first picture, and not directly designed with B, but using two triangles of graphics to form a letter "B". And the initial letter does not necessarily have to be one, can also be combined with two, three or even more initials to design, techniques are just a design method, is to assist us to execute the design skills, must not be limited by these techniques, and this is also a thinking trap that many junior designers are easy to get into.

3) Badge technique: Whether it is typography or logo, we need to pay attention to balance in the design, and everyone knows that the performance of circles and squares is relatively stable and balanced, then the badge can be round, oval, square, rectangle, diamond and other forms of expression. The emblem presentation looks more traditional and applies to all industries.

4) Gradient technique: It looks better visually, but the application scene under the monochrome should also be considered when designing, otherwise the later implementation will also increase the cost of production. The gradient technique is actually similar to the stereoscopic in principle, of course, some industries are still more suitable for gradient color, such as photography, paint, film, etc., you can consider such a method of expression.

5) Storyline: The use of story in the logo is also very much, such as some movie logos, catering logos, etc., such as the colorful cabin in the picture above, leisurely birds, giving people a very happy feeling. For example, the logo of tea or homestay brands, some companies will use a concise and storytelling illustration as a logo, such as tea packaging, tea peripheral product packaging, you can directly extend the logo illustration graphics, make a series of illustrations that adapt to the scene, so that it is very representative, and can better apply the extended value of the logo to the final tea.

STEP 5

In this part of the course, teachers will teach students the design styles that often appear in sign design, and which scene each style feature applies to. In this chapter, students can make up for the recognition of design style, and through the understanding of design methods and styles, students are not only limited to creating in order to complete tasks, but also add more understanding and perceptual colors to the theme of creation. Some students do not understand the content of this chapter well enough, because they are limited to learning to use software to make signs, and ignore the design and conception part. After listening to the teacher's popularization of knowledge, students should actively express their own opinions on each design method and style, and choose the creative method within their own ability.

1) Overlap is applied in logo design, not only to reduce the overall area of each composition unit, so that the logo structure is compact, more importantly, it can make the original plane composition unit hierarchical, three-dimensional, spatial, overlap is one of the techniques often used in modern signs. The picture below shows the World Communications Year emblem using overlapping techniques. The wrong lines in the pattern symbolize both the well-connected highways, indicating that postal communications are all over the world, and the criss-crossing circuits, indicating that telecommunications reach five continents and four seas. In addition, the lines are patterned into four hearts in the four directions of southeast, southwest and northwest, indicating that the people of the world exchange information and seal each other. The form and content of the logo are unified and constitute an outstanding overlapping sign.

2) The shape of geometric signs is often based on human consciousness, abstracting the concept to be conveyed by the logo and giving a deeper meaning of geometric expression. Geometric signs are obtained through geometric cartography, so they are rational and regular signs, which also lead to geometric signs having their own mathematical laws and sense of order, which can present a strong impact in visual performance, easy to identify and easy to remember.

3) Linear signs: Lines can be arranged according to a certain law, or staggered, juxtaposed, touched, or aggregated, dispersed, or freely stretched, forming a sign of line sense. Flexible, free lines can break boundaries and extend infinitely in multi-dimensional space, creating infinite possibilities. Chengdu Luhu • A4 Art Museum LOGO, from the letter "A" and the number "4" deformed to form a combination of broken lines, cut the space into different faces, a few strokes bring a sense of perspective of space, the presentation of thick lines makes the whole structure stable and atmospheric. When the lines extend and intersect and touch in the plane, it seems to converge in the far reaches of space. When the angle between the lines

< 90° , the direction of the line-of-sight guidance is clear and the movement is fast. The folded line of convergence is intended to break the age boundary, transcend the spatial distance, and use the power of art to achieve emotional resonance.

4) Retro style: Whether it is Chinese retro or European and American retro, this style can be described as a hot trend in recent years. The retro logo is generally very textured and has a strong memory point.

6) Creative letters: This style has roughly two creative directions, one is to be creative on a specific letter, and the other is to combine letters with other elements. This style has a strong creative freedom, but it also tests creative ability. Letter icon + industry characteristics is the logo design thinking of brand letters + industry characteristics. Select the most appropriate initials by targeting the industry in which the brand is located. In this way, the combination of the two will make the logo more creative and weighty, rather than just a single set of icon

6) Negative space: The logo of this style is very "niche", the biggest feature of this style is that it has a certain "interpretation" meaning, visually increasing a lot of interest, but increasing the design difficulty and brand prominence.Negative space logo is often used in design skills, excellent negative space logo design works, on the one hand can increase the fun and imagination of the logo itself, on the other hand, can accurately and quickly deliver brand information to the audience, leaving a deep memory.For example, the NBC logo, the blank between purple and red, is a peacock, and the mouth is the gap. The peacock's head turned to the right shows anticipation of the future and no looking back, and the same 6 feathers also hint at the 6 divisions of NBC. A simple shape contains a lot of meaning.

STEP 6

In the final part of the course, the teacher will teach the students about the principles of logo design. Because a successful logo must be suitable for various purposes, the size and scene can be changed at will, and the accurate identification of the audience will not be affected when used in various media. Through this part of the study, students can have a general understanding of the principles of logo design, avoid the situation that visual recognition cannot be carried out in the design process, and achieve a complete set of standardized drawing.

1) Uniqueness is the most basic requirement for logo design. The formal law and particularity of the logo is to have their own unique personality, not allowing the slightest similarity, which makes the design of the logo must be unique, concise and prominent, and pursue to create a unique visual experience and impress.

2) Eyesight is the visual effect that a logo should achieve. A good logo should be attractive and give people a strong visual impact. Because only by attracting people's attention can the message that the logo conveys have an impact on people. In logo design, paying attention to contrast and emphasizing the vividness and vividness of visual images are important formal elements that produce attention.

3) Popularity is an important factor in the easy identification, memory and dissemination of signs. Popularity is not simplification, but less wins more, the intention is profound, the image is obvious, and the elegant and common appreciation are shared. The popular logo has the characteristics of large public recognition and strong sense of intimacy.

4) Versatility means that the logo should have a wide range of adaptability. The requirements for versatility of the logo are determined by the function of the logo and the need to display and publicize the characteristics of the logo in different carriers and environments.

5) The messaging of the logo comes in many ways and forms. The form of logo information transmission includes graphics, text, and a combination of graphics and text; There are direct transmissions and indirect transmissions. People's perception of information is both concrete and abstract; There are explicit and implicit ones.

6) Culturality is an inherent property of the logo itself. The cultural nature in the logo is to show the spiritual information such as national traditions, characteristics of the times, social customs, enterprise or group concepts, etc. through the logo.

7) Artistry is the key to whether logo design gives people the enjoyment of beauty. A highly artistic logo, with accurate positioning, unconventional conception, novel and generous shape; The rhythm is clear and crisp; There are changes in the unity, rich in decorative characteristics and so on.

8) Modernity is the core of the logo in the establishment of corporate image. Trademarks are not only the guarantee of product quality, but also the basis for identifying goods. Economic prosperity, intensified competition, lifestyle changes, fashion trend orientation, etc., require trademarks to adapt to the times.

Assignment Sheet 1
Sign Design

Clarification

Students discuss the reasons for the emergence of sign design styles and how to choose a design style that suits them. At the same time, they integrate the basic knowledge they have learned that can be applied to their own design concepts. Finally, they complete the complete knowledge structure through the supplement of basic knowledge by other students.

Assignment Sheet 2

Sign Design

Clarification

Students determine their own design theme and style, which software to use for design, and choose what they are good at and like. At the same time, students can draw design sketches to discuss with the teacher.

Assignment Sheet 3

Sign Design

Clarification

Students start creating after determining the theme, using PS or AI to create for one hour. After completing the creation, they need to submit it to the teacher for comments and mutual evaluation.

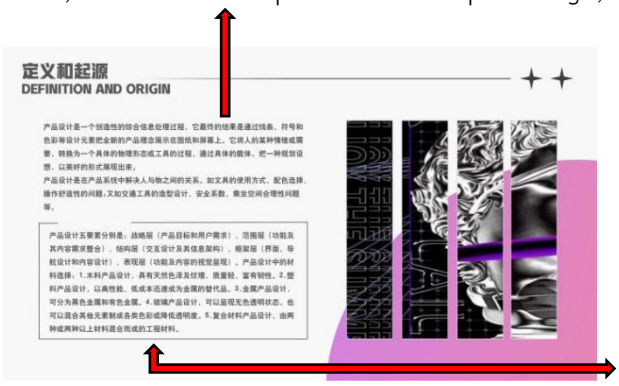
Information Sheet 3
Product Design

Product Design: With the advent of the era of commodity economy, the commercialization of product design needs to be more prominent. Product design is a direct and effective means for enterprises to enhance their competitiveness and provide feasible products. The realization of the commercial value of the product is the importance of product design. Product design plays a role in connecting the present and the future, connecting the market, the company and the user, and designers need to find the balance point. Product design has the importance of "involving the overall situation", good product design, not only manifested in the superiority of function, but also easy to manufacture, low production cost, so that the comprehensive competitiveness of the product can be enhanced.

STEP 1

The course begins with an explanation of the definition and origin of product design: Product design is a creative and integrated information processing process that culminates in the presentation of new product ideas on drawings and screens through design elements such as lines, symbols and colors. It transforms a certain emotion or need of a person into a specific physical form or tool, and through a specific carrier, a planning idea is displayed in a beautiful form.

Product design is to solve the relationship between people and things in the product system. Such as the use of stationery, color selection, operating comfort issues; Another example is the shape design, safety factor, and rationality of the seating space of the vehicle.



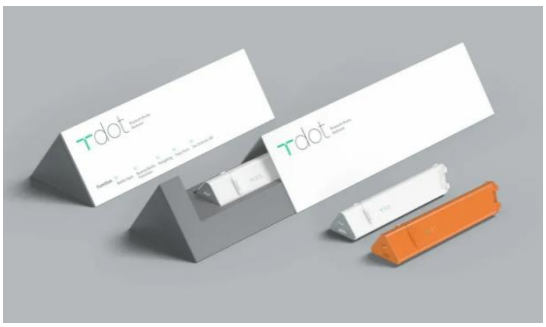
And then the teacher will tell students about the five elements of product design: strategy layer (product goals and user needs), scope layer (integration of functions and their content requirements), structure layer (interaction design and its information architecture), frame--work layer (interface, navigation design and content design), and presentation layer (visual presentation of functions and content).

And then students will learn about material selection in product design: 1. Wood product design, with natural color and texture, light weight, rich in toughness. 2. Plastic product design, with high performance, low cost quickly become a substitute for metal. 3. Metal product design, which can be divided into ferrous metal and non-ferrous metal. 4. Glass product design, can present colorless transparent state, can also be mixed with other elements to make various colors or reduce transparency. 5. Composite product design, engineering materials made of two or more mixed materials.

STEP 2

Then the teacher will lead the students to analyze some excellent design cases, and the teacher will talk about the excellent design parts of the case and whether it is suitable for the current design environment. Students can independently discuss and analyze, give examples of advantages and disadvantages in cases, and think about the common points of this type of design.

1) Tdot/Braille keyboard: The braille keyboard is an important input component in a blind computer, and the braille keyboard is similar to the standard keyboard, except that the braille keyboard provides an equivalent braille symbol in addition to the letter it represents for each key. This product adopts T-folding type in structural design, which greatly improves portability and lightweight compared to traditional Braille keyboards, while greatly reducing the price, and has a variety of color options.



2) Nest/thermostat: A product launched by Nest Labs in the United States, which can intelligently identify user habits by recording the user's indoor temperature data, and adjust the room temperature to the most comfortable state, this product is the Nest thermostatic controller. Nest learns algorithms and proximity sensors to figure out the most suitable temperature for your schedule and adjust accordingly to save energy while making you feel comfortable.

3) Pimoji / New type pill: Pimoji is a new type of pill that is inspired by human organs that changes the shape of the pill and makes it more intuitive. Older people suffer from many chronic illnesses and are taking just as many medications. However, due to poor vision and memory, most older adults often take medications that do not match their symptoms. On the other hand, most traditional pills are similar and difficult to distinguish. Pimoji is shaped like an organ, so it's easy to see what organ or symptom the drug is helpful for. These shape-specific drugs can help not only the elderly, but also those who are blind and unable to discern drugs.

4) Sori Yanagi/Butterfly chair: The uniqueness of the butterfly chair lies in its minimalist blend with the simplicity of Western modern design, while blending the quality and aesthetic spirit of traditional Japanese craftsmanship. The plywood used in this chair is several pieces of veneer glued with adhesive and then thermopressed. Two pieces of curved and shaped fiberboard are screwed on the back, and finally connected and fixed with a copper rod, and the structure is quite simple. The butterfly chair is beautifully shaped, resembling a butterfly flapping its wings, and you can faintly see the shadow of traditional Japanese architecture.

STEP 3

The next part of the teacher will teach students a complete set of product design process, but because the steps are too cumbersome, students do not have enough time in class to do practical operation, so students have completed the preliminary research after class, and only need to complete the concept design and appearance design in class. As for the subsequent software and hardware production, students can make the models drawn in class into physical objects according to their needs and put them into the market.

The general steps of product design mainly include pre-project communication, market research, product planning, concept design, appearance design, structural design, software and hardware design (electronic circuit design, software design), mold design and manufacturing, trial production tracking and market feedback.

1) Pre-project communication: A project must be fully collected and communicated with customers before the project is established, and the main content of communication includes product positioning, design direction, user needs, design content, design style, etc.

2) Market research: This link is very important, involving industry analysis, competitive product analysis, consumer group analysis, product pain point analysis, case analysis, technical feasibility, etc. Through careful and meticulous comprehensive analysis of the market, find out the market, find out the product direction, consumer groups, opportunity points, etc., learn from each other's strengths, and cater to the market, we can design creative and successful products with market demand.

3) Product planning: sufficient market research provides a data-oriented decision-making basis for product planning, and product planning mainly puts

forward the overall idea of product or product line development for the market demand established by market research. The types of product planning can be divided into new product development, old product improvement design, and old product new use expansion.

4) Conceptual design is closely related to design, and creativity is their label. At this stage, the designer or design company will analyze and refine the previous data information, product requirements, etc., combine brainstorming to find innovative solutions, form creative concepts, and gradually optimize, and then carry out the design.

5) Structural design is a very important part of product realization, which is for the design of the internal structure and mechanical connection parts of the product. The quality of structural design directly affects the realization quality and manufacturing cost of the product.

6) Software and hardware design: including electronic circuit design and software design, is an important aspect of product function realization, in which the software interface will affect the human-computer interaction experience. Electronic circuit design and structural design are related and influence each other.

7) Mold design, manufacturing and trial production tracking: After the product structure is designed, the structural prototype (model) is often manufactured for verification before the mold design and manufacturing, and the mold design and manufacturing is carried out only after verification.

8) Market feedback: product trial, sales and use, good at collecting and paying attention to subsequent market feedback, can in turn improve the quality and performance of the product, and provide a design basis for the iteration of the product.

STEP 4

The next part of the teacher will tell students how to use the 3dmax to make product, and what shortcuts exist in the software, which can not only help students become familiar with the software faster, but also shorten the time for students to make software, and focus more on ideas and creation.

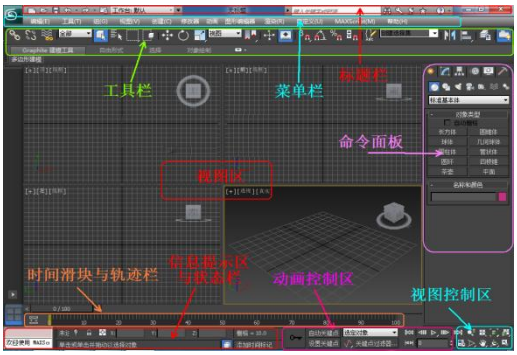
Because students have already learned about CorelDRAW in the sign design course, this section no longer explains the term cdr software.

AUTODESK®
3DS MAX®

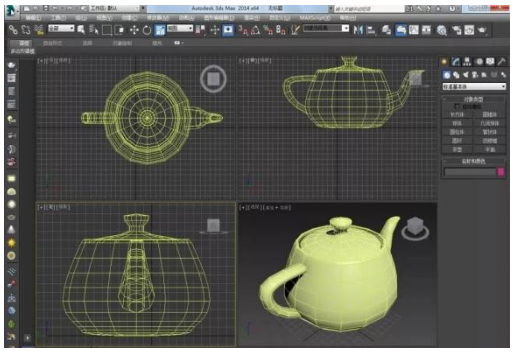
3dMax or 3ds MAX is a three-dimensional animation rendering and production software based on the PC system, which can model, render, do animation, special effects, etc., and is a comprehensive all-round three-dimensional software. 3dMax is widely used in advertising, film and television, industrial design, architectural design, interior design, 3D animation, multimedia production, game design, and engineering visualization.

Next, the teacher will teach students the basic panel of 3dmax first:

1) Topic page



2) View area



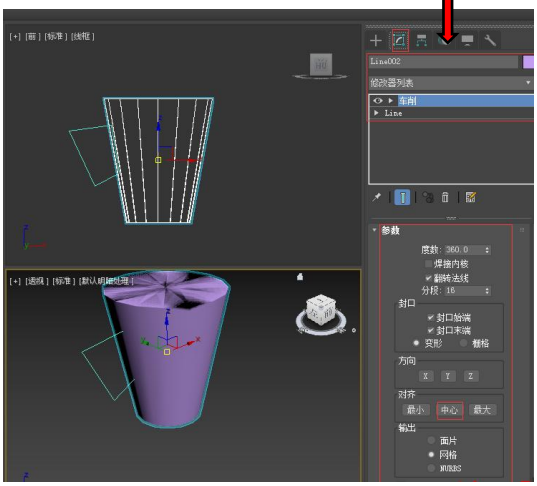
3) Command panel

4) View control area

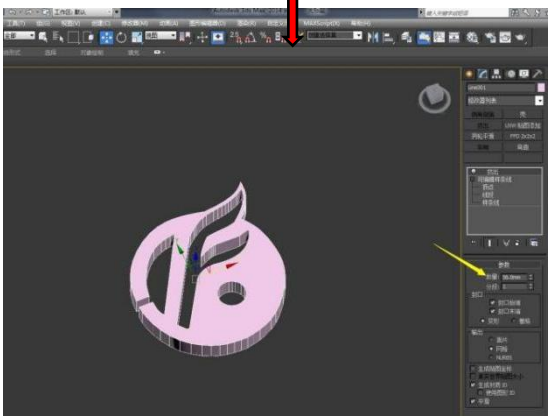
And then, the teacher will teach students the frequently used functions of 3dmax:

1) Creation of objects: Objects are generally created or modified from "standard primitives", "extended primitives" or "base objects that come with the software" or drawn using 'splines'. This is a must-have foundation for getting started with 3dmax.

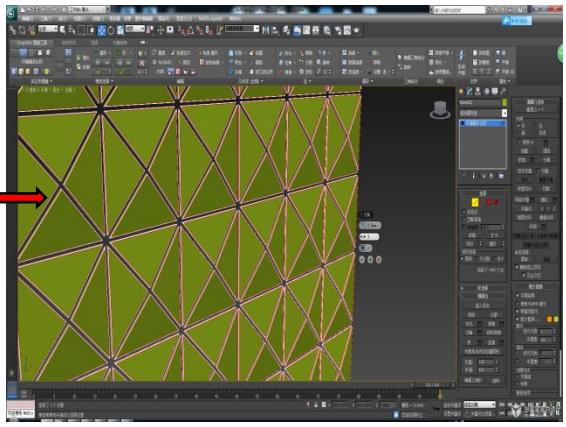
2)How to convert a two-dimensional object into a three-dimensional figure: first draw the floor plan we need, execute the turn command, and turn to create a 3D object by rotating a figure around the axis. Degrees: Determines how many degrees the object rotates around the axis; Flip normals: Depends on the direction and rotation direction of vertices on the graph.



3) 2D modeling base drawing: Select "Graphic" under the "Create" column in the right panel. The system defaults to splines. Then we choose "line" or other style pattern. Then the left mouse button in the left view window determines the starting point. Once you have identified the other endpoint, click the left mouse button (it should be noted here that if you keep left-clicking, the segment will always be created). Once the line is determined, install the "Esc" key or right-click to complete the

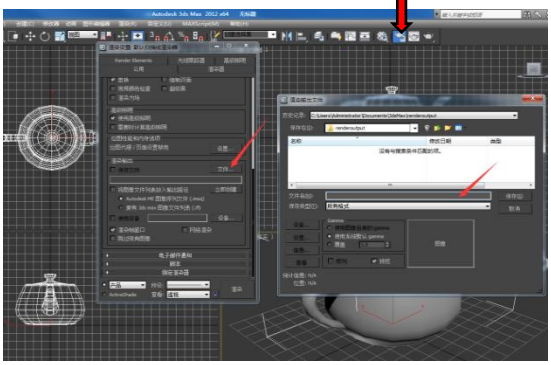


4) 3ds max has three advanced modeling techniques: Mesh mesh, polygonal polygon, patch patch, and nurbs (non-uniform rational b-spline) modeling. There are two main commands for polygon modeling: Editable Mesh (editable mesh) and Editable Poly (editable polygon).

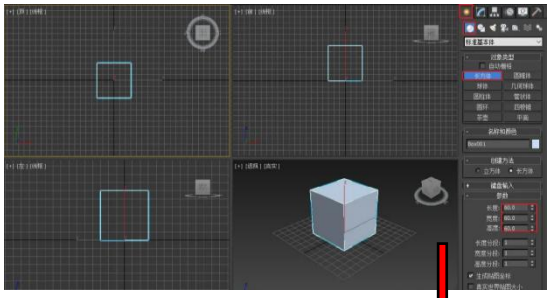


6) How to import the Material Editor: 1.First press the M key to open the Material editor, then click "Get Material". 2.Then in the "Map/Material Browser", select "Browse to Material Library" 3.Then select open in "File" 4. In "Open Material Library", select the location of the material library material you are in. 5. Finally select the desired material, and then select open.

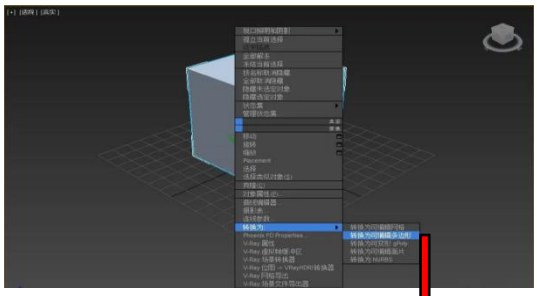
5) How to render the output: select the 3D view, press Alt+W to display it in full screen; Adjust the rendering angle of the model, in the upper toolbar, click Render Settings; Select the settings window and click Renderer to switch between different rendering plugins; Set the rendering size and other specific information below, you can click Rendering; The system automatically starts rendering and pops up a rendering window to wait for the graphics rendering to complete.



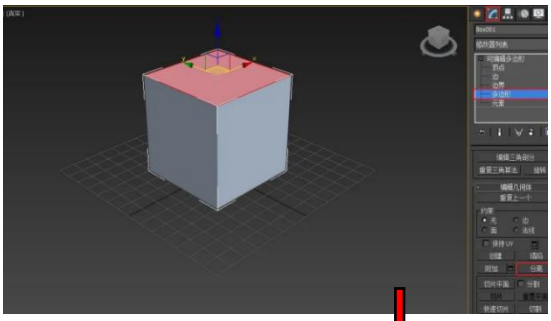
Next, the teacher will teach students how to make basic product with 3dmax:

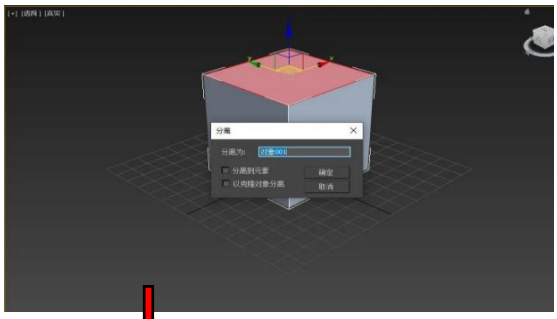


1) Create a cuboid in the front view, set the parameters, length 60, width 60, height 60; The length, width, and height segments are 1.

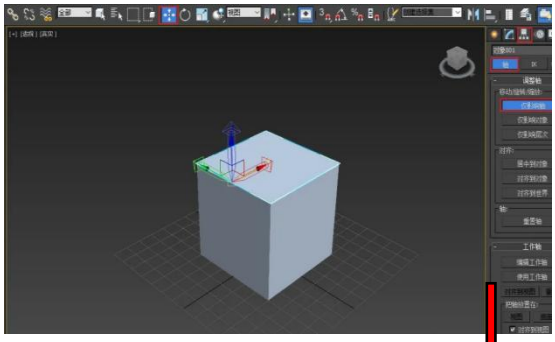


2) Right-click to convert the cuboid to an editable polygon.

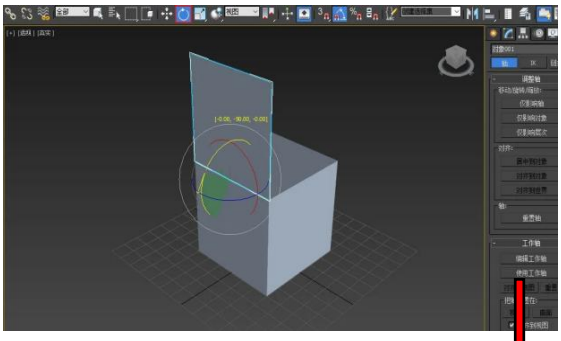




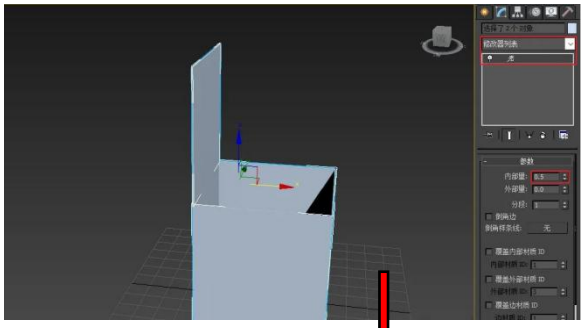
3) In the edit panel, select the Polygon level, select the face at the top of the box in the view, and click Detach. Then determine directly.



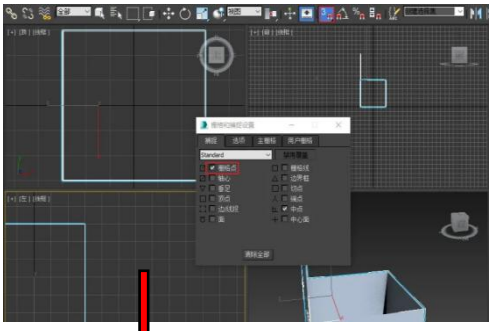
4) Select the newly separated face, enter the Hierarchy panel, turn on Affect Axis Only, and move the axis to the position below below.



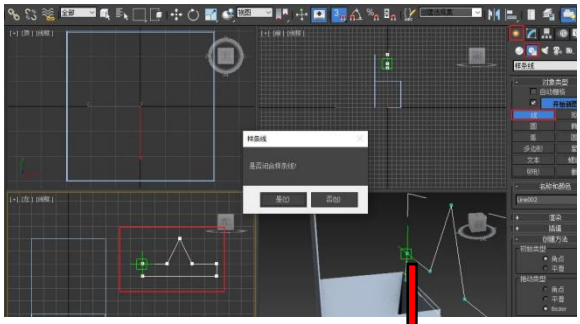
5) Exit [Affects axes only], use the rotation tool, and rotate 90°.



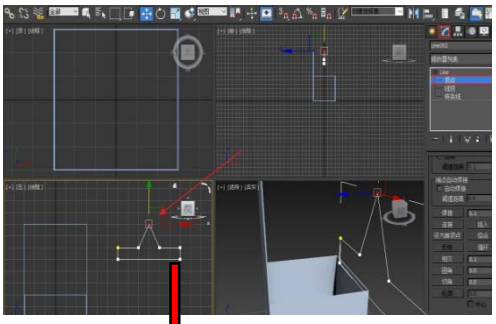
6) Add shell modifiers to all objects in the view, setting the internal quantity to 0.5.



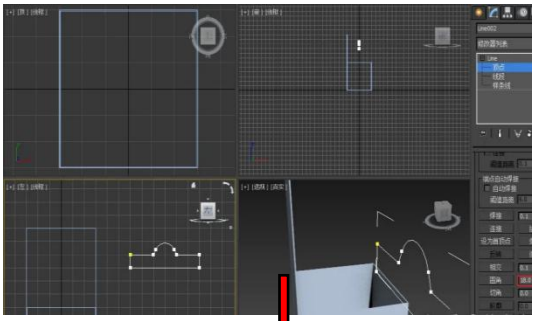
7) Turn on snapping, and check the grid point in the snapping settings (right-click the snapping menu).

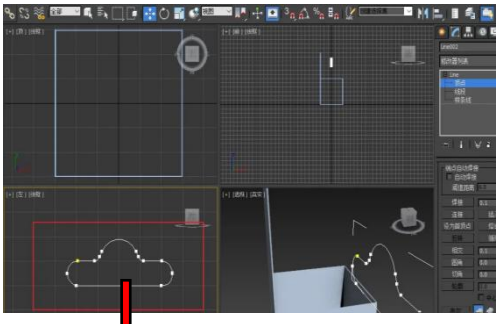


8) In the left view, use Line to create a shape similar to the one shown below.

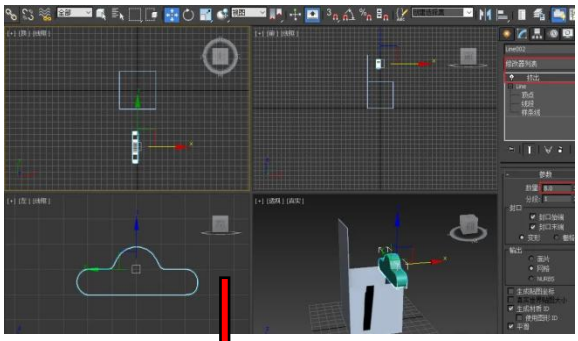


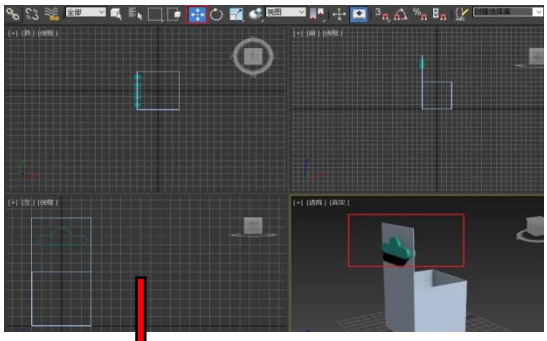
9) Go to the modification panel, select the [Vertex] level, select the vertex shown in the figure below, fillet (slowly increase the fillet value).



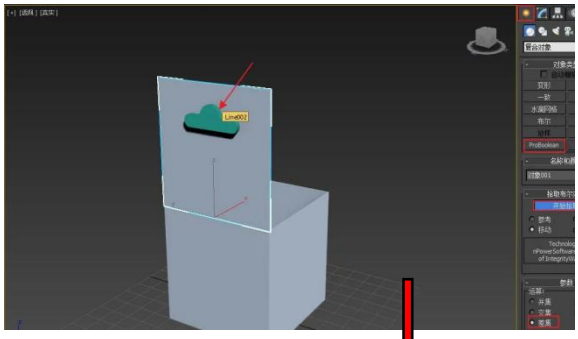


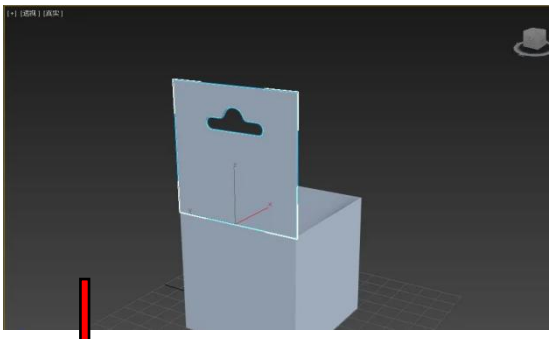
The same method is given to other vertices to round corners.



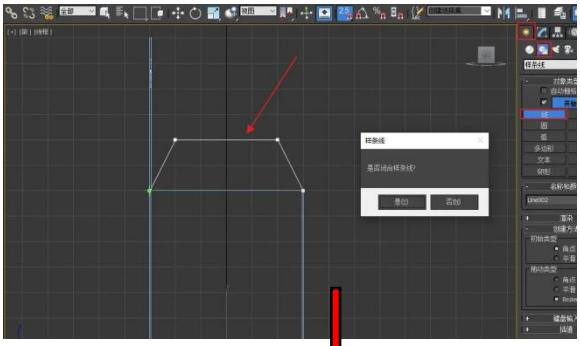


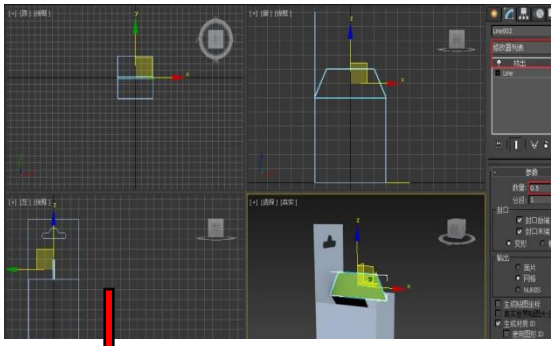
10) Add an Extrusion modifier to the image you just created, setting the quantity value to be larger; Move to the location shown in the view.



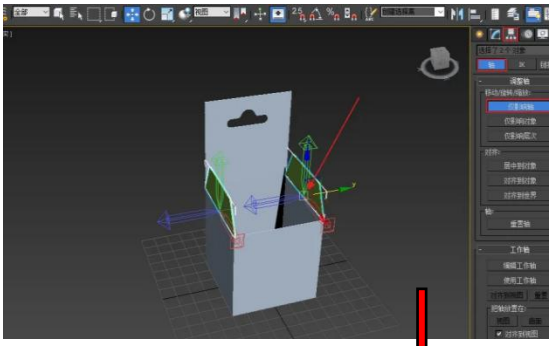


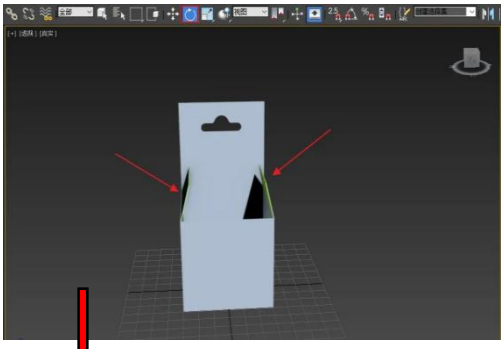
11) Select the box top box, in the creation panel, use [ProBoolean] super boolean to pick up the figure shown in the figure below.



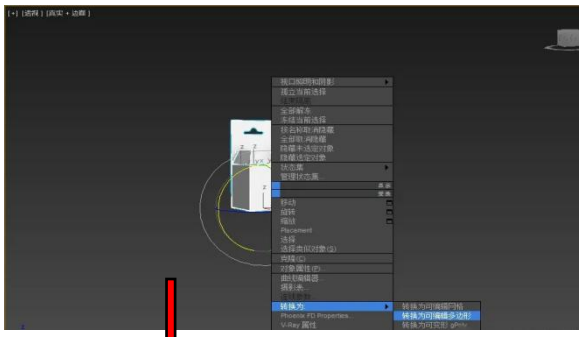


12) In the front view, use [Line] to create a shape like the one below; Add the Extrude modifier to the image you just created, set the number to 0.5, and move to the right.

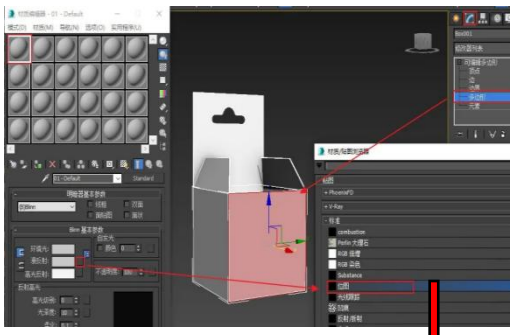




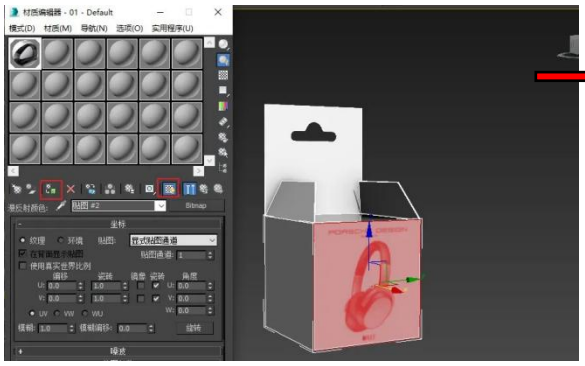
13) Enter the [Hierarchy] panel, open [Affect Axis Only], move the axis to the position below below, exit [Affect Axis Only], and copy a graphic to the other side of the box; Rotate the angle slightly.



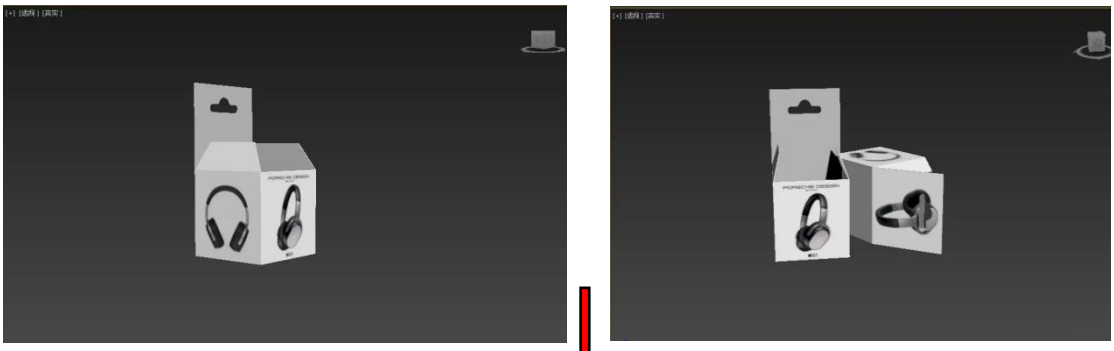
14) Right-click to convert all objects in the view to editable polygons.



15) In the modification panel, select the Polygon level, select the face shown in the figure below, press the M key to open the Material Editor, select a blank shader, and add a texture in diffuse.



16) Assign the shader to the selected polygon and turn on [Show shading materials in view].



17) The same method adds maps to other faces.

Then, the teacher will teach students shortcuts exist in the software:

Forward One [Ctrl+PgUp] Back One [Ctrl+PgDn]
Combine [Ctrl+L] Break Apart [Ctrl+K]
Group Group Objects [Ctrl+G] Convert to Curves [Ctrl+Q]
Convert Outline to Object [Ctrl+Shift+Q]
Object Properties [Alt+Enter] Full Screen Preview [F9]
View Manager [Ctrl+F2] Alignment Guides [Alt+Shift+A]
Dynamic Guides [Alt+Shift+D] Snap to Document Grid [Alt+Y]
Snap to Objects [Alt+Z] Snap Off [Alt+O]
Adjust > Brightness/Contrast/Intensity [Ctrl+B]
Adjust Color Balance [Ctrl+Shift+B]
Adjust> Hue/Saturation/Lightness [Ctrl+Shift+U]
Contour [Ctrl+F9] Envelope [Ctrl+F7]
Lens [Alt+F3] Options [Ctrl+J]
Scripts > Script Manager [Alt+Shift+F11]
Scripts > Script Editor [Alt+F11]
Scripts > Visual Studio Editor [Alt+Shift+F12]
Scripts Stop Recording [Ctrl+Shift+O]
Scripts> Record Temporary Script [Ctrl+Shift+R]
Scripts> Run Temporary Script [Ctrl+Shift+P]

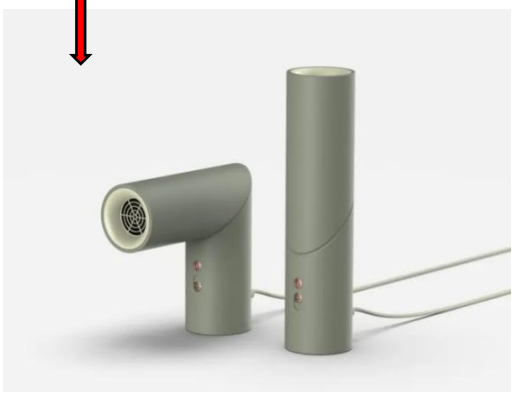
STEP 5

In this part of the course content, teachers will teach students the design methods commonly used in product design, as well as the characteristics of each method and the types of products that are applicable. In this chapter, students can

make up for the missing parts of the design methods and learn more about the types of product design methods.

1) In our daily life, common geometric product shapes are mainly divided into cubes, cylinders, spheres, cones, etc. In the process of modeling geometric shapes, designers need to make further changes and improvements to some original geometric forms according to the specific requirements of the product, such as cutting, combination, mutation, synthesis and other modeling techniques of prototypes to obtain new three-dimensional geometric forms.

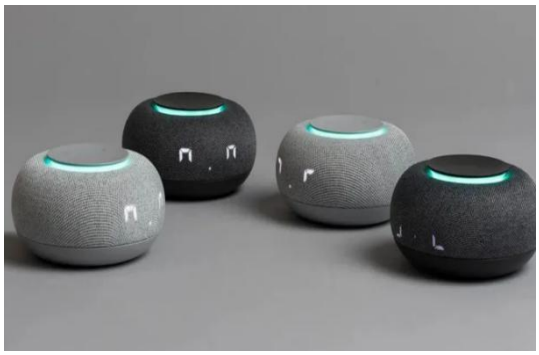
2) Bionic modeling design is a commonly used product modeling method, mainly through form bionic, color bionic, texture bionic. In all bionic designs, nature is the source of human innovation. Bionic design is mainly the use of industrial design art and science combined thinking and methods. Through the existing animals and plants in nature to extract their modeling and appearance elements, including form, appearance, and certain functions. The bionic design in traditional utensils is a continuation of the research on utensils from a new perspective, and is another interpretation of traditional Chinese culture.



3) Wrapped design is a wrap-around, wrap-around design technique, a bit like silkworm chrysalis, zongzi, buns, etc., is a very popular styling design. Generally speaking, it is divided into several types of surface wrapping, comprehensive wrapping, three-sided wrapping, two-sided wrapping, etc., among which more three-sided surface wrapping is used to form an opening on one side, which is used to highlight the interaction and functional area.

4) Products are in a specific form, the process of product design can also be regarded as the process of form creation, cartoon modeling technique is a product modeling method, and bionic design method is the same, cartoon design is a mix of cartoon style, comic curves, whims and promote a special design method of sex life, it mixes people's attitude to enjoy the joy of life into the product styling style.

5) Emotional design refers to designs designed to grab the user's attention and induce emotional responses (conscious or unconscious) to increase the likelihood of performing a particular behavior. In layman's terms, it is designed to stimulate the user in a certain way and make them have emotional fluctuations.

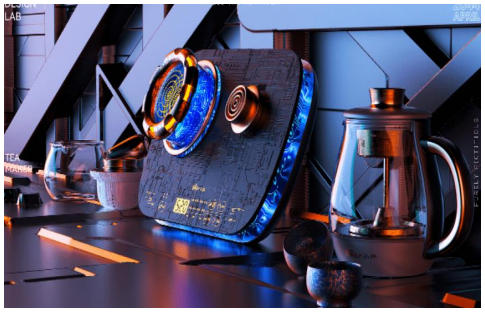


STEP 6

In this part of the course, teachers will teach students the design styles that often appear in product design, and which scene each style feature applies to. In this chapter, students can make up for the recognition of design style, and through the understanding of design methods and styles, students are not only limited to creating in order to complete tasks, but also add more understanding and perceptual colors to the theme of creation. Some students do not understand the content of this chapter well enough, because they are limited to learning to use software to make products, and ignore the design and conception part. After listening to the teacher's popularization of knowledge, students should actively express their own opinions on each design method and style, and choose the creative method within their own ability.

1) Moderate design style: Through emotional design, it conveys the concept of pleasant, comfortable, peaceful and relaxing, makes human-computer interaction more affinity, smooths the inner impetuosity, and is widely used in daily electrical appliances, baby products and other fields. This style of design pays more attention to the freedom, peace and relaxation of the home environment and the quality in line with one's identity, which is suitable for mature, stable and elegant consumers, and is very suitable for mature consumers who are gentle and like to be fashionable.

2) Minimalist design style: With the purpose of shaping aesthetic and high-quality style, the pursuit of fine contrast of materials, abandoning deliberate modification, the modeling language is concise and pure, the lines are rigorous and ingenious, and the pure and classic design is vividly interpreted, and the subtlety of design can be understood after careful tasting. This style is a trend in modern product design. The minimalist design style emphasizes that function is the center of the design, rather than the starting point of the design.



3) Cyberpunk design style: Cyberpunk is a subgenre of science fiction in a futuristic setting, focusing on "a combination of low life and high tech." It is a dystopian science fiction pessimistic philosophy, a human indulgence of future technology. The spiritual core of cyberpunk lies in the negative exterior of human beings, and the inner has always adhered to their own positivity and justice. Common elements are: network, virtual reality; Artificial intelligence such as robots and bionic people.

4) Bauhaus design style: The Bauhaus furniture design pursued functionality, and while pursuing design aesthetics, they wanted products to be available to the masses – mass production through simple design. At the same time, the development of modern industrial technology has also made steel, glass, plywood and other materials more accessible and processed. These materials were considered unconventional materials in furniture making at the time, but were mass-produced and represented the pragmatic spirit of the Bauhaus.

5) Low-profile modeling in LOW-POLY style: Low Poly is a retro-futuristic style design (it can also be called new aesthetic design in itself), returning to the past and back to the future, finding aesthetic balance in the wavering. The flourishing digital art has gone through generations of unlimited pursuit of "realistic" style, but they can never achieve realism, because they are simulating, at this time, some people are tired of simulation, they start to pursue abstract expression.

6) Pop style is an avant-garde and public-oriented design movement, with a clear and eye-catching artistic temperament: popular fun under popularization; Novel matching patterns: red, yellow, blue, strong visual impact, exaggerated and avant-garde art form; Brilliant and exaggerated colors.

Assignment Sheet 1

Product Design

Clarification

Students discuss the reasons for the emergence of sign design styles and how to choose a design style that suits them. At the same time, they integrate the basic knowledge they have learned that can be applied to their own design concepts. Finally, they complete the complete knowledge structure through the supplement of basic knowledge by other students.

Assignment Sheet 2
Product Design

Clarification

Students determine their own design theme and style, because students have only made basic learning about 3Dmax, so students can use the software to make simple products and choose their favorite design method. At the same time, students can draw design sketches and discuss problems in the design with the teacher, such as whether the design structure is reasonable and can be applied to real life.

Assignment Sheet 3

Product Design

Clarification

Students start creating after deciding on a theme, using 3dmax for one hour of easy creation. Once they have finished their creation, they need to submit it to the teacher for review and mutual evaluation.

Appendix D
Research Instrument Analysis Results

Index of Congruence (IOC) Analysis of Training Course Based on Nondirective Teaching Theory to Improve Visual Communication Design Ability of Undergraduate Students

Assessment Item	Expert Person			Total	IOC	Interpretation
	1	2	3			
Activity plan I: Poster Design Training Course						
1. The content is related to the learning objectives.	+1	+1	+1	3	1.00	suitable can be used
2. The learning objectives are consistent with the subject matter.	+1	+1	+1	3	1.00	suitable can be used
3. The Learning Processes are related to teaching.	+1	+1	+1	3	1.00	suitable can be used
4. The Learning activities are related to project-based teaching.	+1	+1	+1	3	1.00	suitable can be used
5. The assignment of work related to the subject of learning.	+1	+1	+1	3	1.00	suitable can be used
6. There are various assessments related with learning objectives.	+1	+1	+1	3	1.00	suitable can be used
7. The measurement and evaluation related with Learning objectives.	+1	+1	+1	3	1.00	suitable can be used

Assessment Item	Expert Person			Total	IOC	Interpretation
	1	2	3			
Activity plan II: Sign Design Training Course						
1. The content is related to the learning objectives.	+1	+1	+1	3	1.00	suitable can be used
2. The learning objectives are consistent with the subject matter.	+1	+1	+1	3	1.00	suitable can be used
3. The Learning Processes are related to teaching.	+1	+1	+1	3	1.00	suitable can be used
4. The Learning activities are related to project-based teaching.	+1	+1	+1	3	1.00	suitable can be used
5. The assignment of work related to the subject of learning.	+1	+1	+1	3	1.00	suitable can be used
6. There are various assessments related with learning objectives.	+1	+1	+1	3	1.00	suitable can be used
7. The measurement and evaluation related with Learning objectives.	+1	+1	+1	3	1.00	suitable can be used

Assessment Item	Expert Person			Total	IOC	Interpretation
	1	2	3			
Activity plan III: Product Design Training Course						
1. The content is related to the learning objectives.	+1	+1	+1	3	1.00	suitable can be used
2. The learning objectives are consistent with the subject matter.	+1	+1	+1	3	1.00	suitable can be used
3. The Learning Processes are related to teaching.	+1	+1	+1	3	1.00	suitable can be used
4. The Learning activities are related to project-based teaching.	+1	+1	+1	3	1.00	suitable can be used
5. The assignment of work related to the subject of learning.	+1	+1	+1	3	1.00	suitable can be used
6. There are various assessments related with learning objectives.	+1	+1	+1	3	1.00	suitable can be used
7. The measurement and evaluation related with Learning objectives.	+1	+1	+1	3	1.00	suitable can be used

Index of Suitable Analysis of Training Course Based on Nondirective Teaching Theory to Improve Visual Communication Design Ability of Undergraduate Students

Assessment Item	Expert Person			$\bar{X}$	SD.	Interpretation
	1	2	3			
Activity plan I: Poster Design Training Course						
1. Learning objectives sort the contents from easy to difficult.	5	5	5	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5	5	5	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5	5	5	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5	5	5	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability	5	5	5	5.00	0.00	Most suitable
6. learning activities linked from basic knowledge to learning from working independently in creative thinking	5	5	5	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5	5	5	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability	5	5	5	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5	5	5	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5	5	5	5.00	0.00	Most suitable

Assessment Item	Expert Person			$\bar{X}$	SD.	Interpretation
	1	2	3			
Activity plan II: Sign Design Training Course						
1. Learning objectives sort the contents from easy to difficult.	5	5	5	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5	5	5	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5	5	5	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5	5	5	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability	5	5	5	5.00	0.00	Most suitable
6. learning activities linked from basic knowledge to learning from working independently in creative thinking	5	5	5	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5	5	5	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability	5	5	5	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5	5	5	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5	5	5	5.00	0.00	Most suitable

Assessment Item	Expert Person			$\bar{X}$	SD.	Interpretation
	1	2	3			
Activity plan III: Product Design Training Course						
1. Learning objectives sort the contents from easy to difficult.	5	5	5	5.00	0.00	Most suitable
2. The nondirective teaching theory are great for encouraging students to think creatively.	5	5	5	5.00	0.00	Most suitable
3. Determining content suitable for the age of students.	5	5	5	5.00	0.00	Most suitable
4. Organizing activities suitable for learning objectives.	5	5	5	5.00	0.00	Most suitable
5. Learning activities can actually improve visual communication design ability	5	5	5	5.00	0.00	Most suitable
6. learning activities linked from basic knowledge to learning from working independently in creative thinking	5	5	5	5.00	0.00	Most suitable
7. The using teaching media are suitable for learning activities.	5	5	5	5.00	0.00	Most suitable
8. The duration of the activities is suitable for the improve of students' visual communication design ability	5	5	5	5.00	0.00	Most suitable
9. Measurement and evaluation are suitable for learning activities to develop real abilities.	5	5	5	5.00	0.00	Most suitable
10. Assessment criteria are appropriate for objective learning.	5	5	5	5.00	0.00	Most suitable

Index of Item Objective Congruence (IOC) Analysis of the Objective Test to Improve Visual Communication Design Ability of Undergraduate Students

Poster Design	Expert Person			Total	IOC	Interpretation
	1	2	3			
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used
Item3	+1	+1	+1	3	1.00	can be used
Item4	+1	+1	+1	3	1.00	can be used
Item5	+1	+1	+1	3	1.00	can be used
Item6	+1	+1	+1	3	1.00	can be used
Item7	+1	+1	+1	3	1.00	can be used
Item8	+1	+1	+1	3	1.00	can be used
Item9	+1	+1	+1	3	1.00	can be used
Item10	+1	+1	+1	3	1.00	can be used
Item11	+1	+1	+1	3	1.00	can be used
Item12	+1	+1	+1	3	1.00	can be used
Item13	+1	+1	+1	3	1.00	can be used
Item14	+1	+1	+1	3	1.00	can be used
Item15	+1	+1	+1	3	1.00	can be used
Item16	+1	+1	+1	3	1.00	can be used
Item17	+1	+1	+1	3	1.00	can be used
Item18	+1	+1	+1	3	1.00	can be used
Item19	+1	+1	+1	3	1.00	can be used
Item20	+1	+1	+1	3	1.00	can be used

Sign Design	Expert Person			Total	IOC	Interpretation
	1	2	3			
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used
Item3	+1	+1	+1	3	1.00	can be used
Item4	+1	+1	+1	3	1.00	can be used
Item5	+1	+1	+1	3	1.00	can be used
Item6	+1	+1	+1	3	1.00	can be used
Item7	+1	+1	+1	3	1.00	can be used
Item8	+1	+1	+1	3	1.00	can be used
Item9	+1	+1	+1	3	1.00	can be used
Item10	+1	+1	+1	3	1.00	can be used
Item11	+1	+1	+1	3	1.00	can be used
Item12	+1	+1	+1	3	1.00	can be used
Item13	+1	+1	+1	3	1.00	can be used
Item14	+1	+1	+1	3	1.00	can be used
Item15	+1	+1	+1	3	1.00	can be used
Item16	+1	+1	+1	3	1.00	can be used
Item17	+1	+1	+1	3	1.00	can be used
Item18	+1	+1	+1	3	1.00	can be used
Item19	+1	+1	+1	3	1.00	can be used
Item20	+1	+1	+1	3	1.00	can be used

Product Design	Expert Person			Total	IOC	Interpretation
	1	2	3			
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used
Item3	+1	+1	+1	3	1.00	can be used
Item4	+1	+1	+1	3	1.00	can be used
Item5	+1	+1	+1	3	1.00	can be used
Item6	+1	+1	+1	3	1.00	can be used
Item7	+1	+1	+1	3	1.00	can be used
Item8	+1	+1	+1	3	1.00	can be used
Item9	+1	+1	+1	3	1.00	can be used
Item10	+1	+1	+1	3	1.00	can be used
Item11	+1	+1	+1	3	1.00	can be used
Item12	+1	+1	+1	3	1.00	can be used
Item13	+1	+1	+1	3	1.00	can be used
Item14	+1	+1	+1	3	1.00	can be used
Item15	+1	+1	+1	3	1.00	can be used
Item16	+1	+1	+1	3	1.00	can be used
Item17	+1	+1	+1	3	1.00	can be used
Item18	+1	+1	+1	3	1.00	can be used
Item19	+1	+1	+1	3	1.00	can be used
Item20	+1	+1	+1	3	1.00	can be used

Index of Item Objective Congruence (IOC) Analysis of the Performance Test to Improve Visual Communication Design Ability of Undergraduate Students

The Item test	Expert Person			Total	IOC	Interpretation
	1	2	3			
Poster Design						
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used
Sign Design						
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used
Product Design						
Item1	+1	+1	+1	3	1.00	can be used
Item2	+1	+1	+1	3	1.00	can be used

Analysis of difficulty value (p) and discrimination power (r) of the Objective test to Improve Visual Communication Design Ability by Non-sample Students

Poster Design	difficulty value (p)	Discrimination power (r)	Consideration
Item1	0.53	0.11	cut off
Item2	0.63	0.21	selected
Item3	0.55	0.37	selected
Item4	0.58	-0.11	cut off
Item5	0.47	0.21	selected
Item6	0.66	0.37	selected
Item7	0.50	0.26	selected
Item8	0.63	0.21	selected
Item9	0.53	0.53	selected
Item10	0.58	0.00	cut off
Item11	0.58	0.42	selected
Item12	0.66	0.05	cut off
Item13	0.68	-0.21	cut off
Item14	0.29	0.26	selected
Item15	0.61	0.37	selected
Item16	0.71	0.37	selected
Item17	0.53	0.21	selected
Item18	0.47	0.32	selected
Item19	0.42	0.21	selected
Item20	0.58	-0.32	cut off

From the table analyzing the difficulty value (p) and discrimination power (r) of the objective test to improve visual communication design ability, it was found that out of the 20 items of poster design. There were 14 quality items selected to be used for testing with the sample group. A difficulty value of between 0.29-0.71 and the discrimination power between 0.21-0.53, namely items 2, 3, 5, 6, 7, 8, 9, 11, 14, 15, 16, 17, 18, and 19.

Sign Design	difficulty value (p)	Discrimination power (r)	Consideration
Item1	0.53	0.11	cut off
Item2	0.53	0.53	selected
Item3	0.55	0.26	selected
Item4	0.58	-0.32	cut off
Item5	0.53	0.21	selected
Item6	0.58	0.32	selected
Item7	0.63	-0.42	cut off
Item8	0.58	0.42	selected
Item9	0.55	0.26	selected
Item10	0.55	0.05	cut off
Item11	0.63	0.21	selected
Item12	0.58	-0.11	cut off
Item13	0.53	0.32	selected
Item14	0.61	0.26	selected
Item15	0.61	0.26	selected
Item16	0.61	-0.05	cut off
Item17	0.53	0.42	selected
Item18	0.63	0.21	selected
Item19	0.45	0.26	selected
Item20	0.39	0.26	selected

From the table analyzing the value (p) and discrimination power (r) of the objective test to improve visual communication design ability, it was found that out of the 20 items of sign design. There were 14 quality items selected to be used for testing with the sample group. A difficulty value of between 0.39-0.63 and the discrimination power between 0.21-0.53, namely items 2, 3, 5, 6, 8, 9, 11, 13, 14, 15, 17, 18, 19, and 20.

Product Design	difficulty value (p)	Discrimination power (r)	Consideration
Item1	0.47	0.11	cut off
Item2	0.50	0.37	selected
Item3	0.61	0.37	selected
Item4	0.61	0.26	selected
Item5	0.47	0.32	selected
Item6	0.63	0.11	cut off
Item7	0.55	0.26	selected
Item8	0.58	0.21	selected
Item9	0.47	-0.21	cut off
Item10	0.50	-0.26	cut off
Item11	0.53	0.32	selected
Item12	0.37	0.21	selected
Item13	0.53	0.00	cut off
Item14	0.53	0.21	selected
Item15	0.47	0.21	selected
Item16	0.47	0.42	selected
Item17	0.42	0.00	cut off
Item18	0.61	0.26	selected
Item19	0.47	0.00	cut off
Item20	0.53	0.21	selected

From the table analyzing the difficulty value (p) and the discrimination power (r) of the objective test to improve visual communication design ability, it was found that out of the 20 items of sign design. There were 13 quality items selected to be used for testing with the sample group. A difficulty value of between 0.37-0.61 and the discrimination power between 0.21-0.42, namely items 2, 3, 4, 5, 7, 8, 11, 12, 14, 15, 16, 18, and 20.

Visual communication design ability score between before and after the nondirective teaching of nursing students

Student number	Pre-test scores (71)			Post-test scores (71)			Difference Score
	Objective test (41)	Performance test (30)	total	Objective test (41)	Performance test (30)	total	
1	22	16	38	37	24	61	23
2	27	14	41	39	23	62	21
3	22	15	37	36	24	60	23
4	24	15	39	38	25	63	24
5	23	14	37	43	22	65	28
6	23	17	40	35	25	60	20
7	27	16	43	36	24	60	17
8	22	15	37	35	26	61	24
9	22	10	32	38	21	59	27
10	25	12	37	39	24	63	26
11	24	14	38	38	23	61	23
12	22	15	37	38	23	61	24
13	25	12	37	37	26	63	26
14	22	16	38	38	25	63	25
15	21	17	38	37	25	62	24
16	22	14	36	37	21	58	22
17	25	16	41	38	24	62	21
18	24	13	37	37	24	61	24
19	23	15	38	40	24	64	26
20	22	10	32	38	20	58	26
21	25	18	43	40	26	66	23
22	24	14	38	37	24	61	23
23	24	15	39	36	22	58	19
24	21	18	39	38	24	62	23
25	30	14	44	39	21	60	16
26	24	14	38	35	22	57	19
27	23	15	38	40	23	63	25
28	24	16	40	37	24	61	21
29	24	17	41	36	26	62	21
30	22	11	33	38	22	60	27
31	29	14	43	40	23	63	20

Student number	Pre-test scores (71)			Post-test scores (71)			Difference Score
	Objective test (41)	Performance test (30)	total	Objective test (41)	Performance test (30)	total	
32	24	16	40	36	25	61	21
33	26	14	40	38	24	62	22
34	20	14	34	38	24	62	28
35	17	15	32	36	24	60	28
36	24	12	36	38	22	60	24
37	24	13	37	36	23	59	22
38	21	14	35	36	22	58	23
$\bar{X}$	23.50	14.47	37.97	37.58	23.53	61.11	23.13
S.D.	2.34	1.90	2.95	1.65	1.50	1.97	2.88

Appendix E
Research Instrument

Activity Plan I

Content

Poster design

Objective of Leaning

1.Students can tell the importance and components of poster design (K)

2. Students can explain different poster design methods. (K)

3. Students can create poster design. (P)

Main point/concept

Poster design

The Visual communication design with poster and Creative visual communication design with poster is one of the forms of visual communication, through the composition of the layout in the first time to attract people's attention, and get instant stimulation, which requires the designer to complete the combination of pictures, text, color, space and other elements, in an appropriate form to show people propaganda information. Learning this article requires mastering the following knowledge points: 1) Basic knowledge: Learn basic poster design knowledge and update the design concept through the learned knowledge points. 2) Design concepts and skills: Have a full understanding of the definition of poster design and the tools. 3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”. 4) Thinking: Students can independently think about the creative tools, such as computer creation/hand-drawing/hand-crafting, etc. 5) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way. 6) Student practical exercises. (Basic Knowledge and Hands-on process)

There are four contents for teaching in poster design:

1) For the teaching of knowledge defined by poster design.

2) For the teaching of knowledge of poster design software tools.

3) Teaching different design methods in poster design.

4) Inspire students' open-mindedness and enhance their sense of experience.

Learning processes

1. Introduction

Introduce the learning objectives of poster design. The teacher first introduces this lesson's teaching content and learning objectives to the students, and explains the content and importance of the teaching objectives in detail. Students can clearly understand the teaching objectives to achieve the expected teaching effect is very important.

2. Leaning and practice: Basic Knowledge

1) Basic knowledge: Learn basic poster design knowledge and update the design concept through the learned knowledge points.

2) Design concepts and skills: Have a full understanding of the definition of poster design and the tools.

3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”.

3. Leaning and practice: Hands-on process

1) Thinking: Students can independently think about the creative tools, such as computer creation/hand-drawing/hand-crafting, etc.

2) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way.

3) Student practical exercises. (Basic Knowledge and Hands-on process)

Learning Activity

Nondirective teaching theory have 5 steps as follows: 1) Study 2) Discussion 3) Thinking 4) Implement creation and 5) Summary analysis.

Step 1 Study

At this stage, students are mainly required to systematically learn basic poster design knowledge and update the design concept through the learned knowledge points. In this teaching step, because students already have a specific understanding of the use of tools, but do not know how to choose the right tools for different styles of poster design. Therefore, students need to understand the skills of poster design and the design style that suits them or they like it. In the teaching process, the theoretical knowledge is explained and excellent cases are displayed on the projector, and the students’ design behavior is stimulated by the stimulation of students’ visual senses.

1.1 Teacher teach students about the definition, importance and components of poster design at home and abroad, and trace the origin of poster design.

1.2 Teachers show students the ancient and modern and excellent poster design cases at home and abroad to stimulate students' sensory experience.

1.3 Teacher teach students the tools and means needed for poster design and students can choose their own tools according to their own needs.

1.4 Teacher teach students different poster design methods and design styles, and students can choose their favorite or suitable concepts for the current design environment to apply to their own design works in some excellent cases.

Step 2 Discussion

In the following discussion stage, in the study of basic knowledge, students give their own judgments on a series of questions such as "why this style appears" and "how to choose a design style that suits you", students express their own views and opinions on some excellent cases, and explain the knowledge learned in the teaching of basic knowledge and can be applied to their own design concepts. In the discussion stage, students' understanding of design styles and design tools is based on the knowledge they have learned before, and teachers give appropriate evaluations and analyses through students' speeches, and students can also exchange the knowledge they have discovered to integrate them.

2.1 Students summarize what they have learned in basic learning and discuss with their teachers and ask questions.

2.2 Students discuss what shortcomings existed in previous design works, what advantages they learned in the study of basic knowledge, and how to correct them in subsequent design works.

2.3 Students discuss what troubles the design tools they have learned before in the design process, and what mistakes these troubles will cause in the process of designing works, and teachers can answer and demonstrate according to the questions and problems raised by students.

2.4 At the end of the discussion phase, the teacher summarizes the questions raised by the students and the design concepts learned, and continuously follows up and optimizes.

Step 3 Thinking

After discussion, the students' design concepts were updated, and the previous gap in poster design was filled through the study of basic knowledge. In the next thinking stage, students should summarize the conclusions reached in the discussion stage, have a preliminary plan for their next design works, think about how to determine how to suit their own design theme and style, what design means to use, determine what kind of design theme is in line with the current situation, and choose what they are good at or like in the choice of design tools. Because the teacher has already answered the questions raised by the students during the discussion stage, the students can think about whether it will help them in the design they will carry out at this stage, and after the thinking work, the students can draw up a sketch and discuss it with the teacher.

3.1 After discovering and discussing the problems, students have a deeper understanding of the basic knowledge of sign design, and can study their own design style in a targeted manner, which not only broadens their knowledge, but also sublimates the design concept.

3.2 After the discussion, students can think about and determine their own design theme and design style, the theme must be in line with the current design environment and concept, and the theme is determined and submitted to the teacher for improvement.

3.3 After determining the theme, students should think about creative methods and tools, such as using Adobe Illustrator, Photoshop or CorelDRAW in the computer to create, students can also try hand-drawn creation in a hand-drawn board, or detach from electronic products for hand-made in the traditional sense.

3.4 The teacher counts the themes and creative tools identified by each student, and proposes suggestions for improvement.

Step 4 Planning creation

After making preliminary preparations, students need to clarify the audience and posting environment of the creative theme, and determine the color/typography/ font/creative method according to the audience, such as product-themed poster design for products, or poster design with the theme of activity content for promotional activities. Next, students can create themes according to the advantages and disadvantages of excellent cases learned in basic learning, not limited to print posters, posters, advertising posters and commercial posters, but also do not limit the use of creative tools.

4.1 Students first clarify the design ideas and audiences, convert the draft theme determined in the thinking session into the required design tools, and use the large color tones and design elements present in the poster to create them as a foreshadowing for the overall work.

4.2 Secondly, it is necessary to clarify the layout in the design and organically combine different elements. For example, in a poster design with the help of frame templates (regular and irregular frames, invisible frames and explicit frames).

4.3 In the process of poster design, the advantages of drawing on excellent cases will be applied to their own design works, and the concept of independent learning and independent design will be fully utilized. Therefore, everyone's design works have their own style embodiment.

4.4 After the basic creation is completed, students should think about how to convey information to the audience, first of all, a complete and perfect design method expressed in traditional aesthetics, which will be appreciated, read and remembered by the audience; The second is in a novel or surprising way. A good design work is not only good looking, but also think about how to catch the audience's attention, match the appropriate copy, and make your design work complete.

Step 5 Summary analysis

After students complete the creation of their works, they should first explain their design concepts and design processes and the troubles encountered in the design process, and then students will conduct self-evaluation, mutual evaluation between students and evaluation by teachers. Secondly, students talk about what their abilities have improved in this course and what needs to be improved. Finally, the teacher compared and analyzed the students' previous design work and summarized the inadequacy.

5.1 Students begin by presenting their work to other students and teachers, and explain the design philosophy and design methodology, as well as what troubles existed in the design process.

5.2 Students self-evaluate their design works, students can evaluate each other, and then the teacher will give corresponding scores after comments (according to the novelty of the students' design theme, the rationality of the design layout, the proficiency in the use of design elements, and the use of production means).

5.3 Teachers compare the changes of students' design ability before and after applying nondirective teaching theories, and analyze the advantages and disadvantages in the design process and the points worth learning.

5.4 Finally, the teacher summarizes and analyzes what has been learned throughout the course and counts the student’s degree of excellences.

measurement and Evaluation

1) Assignment form and checking

2) Observe the practice of poster design

Instructional Media

1) Teachers self-test and self-evaluate

2) Teachers use computers and projectors to teach, and students use computers to create.

Training Schedule: Poster design

Date/time	Teaching Process	Remark
Day 1 08.30 – 09.30	 Pre-test Multiple choice and practice test “poster design”	 1 hour
09.30 – 11.00	**Introduction** **Lecture** Basic knowledges, Design concepts and skills, Discussion **Leaning and practice:** Hands-on process and practical exercises	1.5 hour
11.00 – 12.00	**Learning Activity:** Nondirective teaching theory have 5 steps 1) Study	1 hour
12.00 – 13.00	Lunch Time	
13.00 – 13.30	2) Discussion	30 minutes
13.30 – 14.00	3) Thinking	30 minutes
14.00 – 15.00	4) Planning creation	1 hour
15.00 – 15.30	5) Summary analysis	30 minutes

Activity Plan II

Content

Sign design

Objective of Leaning

1. Students can tell the importance and components of sign design. (K)
2. Students can explain different sign design methods. (K)
3. Students can create sign design. (P)

Main point/concept

Sign design

The Visual communication design with sign and Creative visual communication design with sign is one of the forms of visual communication, a sign is a sign that indicates the characteristics of something. It uses simple, significant and easily recognizable objects, graphics or text symbols as an intuitive language, and has the functions of expressing meaning, emotion and command action. Sign design is not only the design of practical objects, but also the design of graphic art. It has similarities with other graphic art expressions, but also has its own artistic laws. Learning this article requires mastering the following knowledge points: 1) Basic knowledge: Learn basic poster design knowledge and update the design concept through the learned knowledge points. 2) Design concepts and skills: Have a full understanding of the definition of sign design and the tools. 3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”. 4) Thinking: Students can independently think about the creative tools, such as computer creation/hand-drawing/hand-crafting, etc. 5) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way. 6) Student practical exercises. (Basic Knowledge and Hands-on process)

There are four contents for teaching in sign design:

1) For the teaching of knowledge defined by sign design.
2) For the teaching of knowledge of sign design software tools.
3) Teaching different design methods in sign design.
4) Inspire students' open-mindedness and enhance their sense of experience.

Learning processes

1. Introduction

Introduce the learning objectives of sign design. The teacher first introduces this lesson's teaching content and learning objectives to the students, and explains the content and importance of the teaching objectives in detail. Students can clearly understand the teaching objectives to achieve the expected teaching effect is very important.

2. Leaning and practice: Basic Knowledge

1) Basic knowledge: Learn basic sign design knowledge and update the design concept through the learned knowledge points.

2) Design concepts and skills: Have a full understanding of the definition of sign design and the tools.

3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”.

3. Leaning and practice: Hands-on process

1) Thinking: Students can independently think about the creative methods, such as computer creation/hand-drawing/hand-crafting, etc.

2) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way.

3) Student practical exercises. (Basic Knowledge and Hands-on process)

Learning Activity

Nondirective teaching theory have 5 steps as follows: 1) Study 2) Discussion 3) Thinking 4) Implement creation and 5) Summary analysis.

Step 1 Study

At this stage, students are mainly required to systematically learn basic sign design knowledge and update the design concept through the learned knowledge points. In this teaching step, because students already have a specific understanding of the use of tools, but do not know how to choose the right tools for different styles of sign design. Therefore, students need to understand the skills of sign design and the design style that suits them or they like it. In the teaching process, the theoretical knowledge is explained and excellent cases are displayed on the projector, and the students’ design behavior is stimulated by the stimulation of students’ visual senses.

1.1 Teacher teach students about the definition, importance and components of sign design at home and abroad , and trace the origin of sign design.

1.2 Teachers show students the ancient and modern and excellent sign design cases at home and abroad to stimulate students' sensory experience.

1.3 Teacher teach students the tools and means needed for sign design and students can choose their own tools according to their own needs.

1.4 Teacher teach students different sign design methods and design styles, and students can choose their favorite or suitable concepts for the current design environment to apply to their own design works in some excellent cases.

Step 2 Discussion

In the following discussion stage, in the study of basic knowledge, students give their own judgments on a series of questions such as "why this style appears" and "how to choose a design style that suits you", students express their own views and opinions on some excellent cases, and explain the knowledge learned in the teaching of basic knowledge and can be applied to their own design concepts. In the discussion stage, students' understanding of design styles and design tools is based on the knowledge they have learned before, and teachers give appropriate evaluations and analyses through students' speeches, and students can also exchange the knowledge they have discovered to integrate them.

2.1 Students summarize what they have learned in basic learning and discuss with their teachers and ask questions.

2.2 Students discuss what shortcomings existed in previous design works, what advantages they learned in the study of basic knowledge, and how to correct them in subsequent design works.

2.3 Students discuss what troubles the design tools they have learned before in the design process, and what mistakes these troubles will cause in the process of designing works, and teachers can answer and demonstrate according to the questions and problems raised by students.

2.4 At the end of the discussion phase, the teacher summarizes the questions raised by the students and the design concepts learned, and continuously follows up and optimizes.

Step 3 Thinking

After discussion, the students' design concepts were updated, and the previous gap in sign design was filled through the study of basic knowledge. In the

next thinking stage, students should summarize the conclusions reached in the discussion stage, have a preliminary plan for their next design works, think about how to determine how to suit their own design theme and style, what design means to use, determine what kind of design theme is in line with the current situation, and choose what they are good at or like in the choice of design tools. Because the teacher has already answered the questions raised by the students during the discussion stage, the students can think about whether it will help them in the design they will carry out at this stage, and after the thinking work, the students can draw up a sketch and discuss it with the teacher.

3.1 After discovering and discussing the problems, students have a deeper understanding of the basic knowledge of sign design, and can study their own design style in a targeted manner, which not only broadens their knowledge, but also sublimates the design concept.

3.2 After the discussion, students can think about and determine their own design theme and design style, the theme must be in line with the current design environment and concept, and the theme is determined and submitted to the teacher for improvement.

3.3 After determining the theme, students should think about creative methods and tools, such as using Adobe Illustrators, Photoshop or CorelDRAW in the computer to create, you can also try hand-drawn creation in a hand-drawn board, or detach from electronic products for hand-made in the traditional sense.

3.4 The teacher counts the themes and creative tools identified by each student, and proposes suggestions for improvement.

Step 4 Planning creation

After making preliminary preparations, students need to clarify the audience and posting environment of the creative theme, and determine the color/typography/ font/creative method according to the audience, such as sign design or update for a company, or specific sign design for a large event. Next, students can create themes according to the advantages and disadvantages of excellent cases learned in basic learning, not limited to trademarks, signs, corporate signs and traffic signs, nor to the use of creative tools.

4.1 Students first clarify the design ideas and audiences, convert the draft theme determined in the thinking session into the required design tools, and use the large color tones and design elements present in the sign to create them as a foreshadowing for the overall work.

4.2 Secondly, it is necessary to clarify the layout in the design and organically combine different elements. For example, in a sign design for the choice of fonts and colors.

4.3 In the process of sign design, the advantages of drawing on excellent cases will be applied to their own design works, and the concept of independent learning and independent design will be fully utilized. Therefore, everyone's design works have their own style embodiment.

4.4 After the basic creation is completed, students should think about how to convey information to the audience, first of all, a complete and perfect design method expressed in traditional aesthetics, which will be appreciated, read and remembered by the audience; The second is in a novel or surprising way. A good design work is not only good looking, but also think about how to catch the audience's attention, match the appropriate copy, and make your design work complete.

Step 5 Summary analysis

After students complete the creation of their works, they should first explain their design concepts and design processes and the troubles encountered in the design process, and then students will conduct self-evaluation, mutual evaluation between students and evaluation by teachers. Secondly, students talk about what their abilities have improved in this course and what needs to be improved. Finally, the teacher compared and analyzed the students' previous design work and summarized the inadequacy.

5.1 Students begin by presenting their work to other students and teachers, and explain the design philosophy and design methodology, as well as what troubles existed in the design process.

5.2 Students self-evaluate their design works, students can evaluate each other, and then the teacher will give corresponding scores after comments (according to the novelty of the students' design theme, the rationality of the design layout, the proficiency in the use of design elements, and the use of production means).

5.3 Teachers compare the changes of students' design ability before and after applying nondirective teaching theories, and analyze the advantages and disadvantages in the design process and the points worth learning.

5.4 Finally, the teacher summarizes and analyzes what has been learned throughout the course and counts the student’s degree of excellences.

measurement and Evaluation

1. Assignment form and checking
2. Observe the practice of sign design

Instructional Media

1. Teachers self-test and self-evaluate
2. Teachers use computers and projectors to teach, and students use computers to create.

Training Schedule: Sign design

Date/time	Teaching Process	Remark
Day 2		
08.30 – 09.30	Pre-test Multiple choice and practice test “sign design”	1 hour
09.30 – 11.00	**Introduction** **Lecture** Basic knowledges, Design concepts and skills, Discussion **Leaning and practice:** Hands-on process and practical exercises	1.5 hour
11.00 – 12.00	**Learning Activity:** Nondirective teaching theory have 5 steps 1) Study	1 hour
12.00 – 13.00	Lunch Time	
13.00 – 13.30	2) Discussion	30 minutes
13.30 – 14.00	3) Thinking	30 minutes
14.00 – 15.00	4) Planning creation	1 hour
15.00 – 15.30	5) Summary analysis	30 minutes

Activity Plan III

Content

Product design

Objective of Leaning

1. Students can tell the importance and components of product design. (K)
2. Students can explain different product design methods. (K)
3. Students can create product design. (P)

Main point/concept

Product design

The Visual communication design with product and Creative visual communication design with product is one of the forms of visual communication, product design is a process of transforming a certain purpose or need into a specific physical form or tool, and is a creative activity process expressed through a specific carrier of planning, planning and vision and problem-solving methods. In this process, the shape of the product is displayed in a flat or three-dimensional form through the combination of various elements such as lines, symbols, numbers, colors, etc. Learning this article requires mastering the following knowledge points: 1) Basic knowledge: Learn basic product design knowledge and update the design concept through the learned knowledge points. 2) Design concepts and skills: Have a full understanding of the definition of product design and the tools. 3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”. 4) Thinking: Students can independently think about the creative tools, such as computer creation/hand-drawing/hand-crafting, etc. 5) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way. 6) Student practical exercises. (Basic Knowledge and Hands-on process)

There are four contents for teaching in product design:

1) For the teaching of knowledge defined by product design.
2) For the teaching of knowledge of product design software tools.
3) Teaching different design methods in product design.
4) Inspire students' open-mindedness and enhance their sense of experience.

Learning processes

1. Introduction

Introduce the learning objectives of product design. The teacher first introduces this lesson's teaching content and learning objectives to the students, and explains the content and importance of the teaching objectives in detail. Students can clearly understand the teaching objectives to achieve the expected teaching effect is very important.

2. Leaning and practice: Basic Knowledge

1) Basic knowledge: Learn basic product design knowledge and update the design concept through the learned knowledge points.

2) Design concepts and skills: Have a full understanding of the definition of product design and the tools.

3) Discussion: Students give their own judgments on a series of questions such as “why” and “how”.

3. Leaning and practice: Hands-on process

1) Thinking: Students can independently think about the creative methods, such as computer creation/hand-drawing/hand-crafting, etc.

2) Implement creation: Thinking about how to convey a message to the viewer is firstly a complete and perfect design approach expressed in traditional aesthetics, and the second is a novel or surprising way.

3) Student practical exercises. (Basic Knowledge and Hands-on process)

Learning Activity

Nondirective teaching theory have 5 steps as follows: 1) Study. 2) Discussion. 3) Thinking. 4) Implement creation. 5) Summary analysis.

Step 1 Study

At this stage, students are mainly required to systematically learn basic product design knowledge and update the design concept through the learned knowledge points. In this teaching step, since product design has some difficulties for visual communication design students, the product design lesson program will focus on guiding students through the formation process of the product, from how to conduct initial research on the product, to sketch the product in CorelDRAW, and finally to basic modeling of the product in 3DMAX. Whether it is the theoretical knowledge used in product design or the operational foundation, it is more difficult than poster design and sign design, so the teacher will talk about some advanced methods in the use of software in the class. Therefore, students need to understand

the skills of product design and the design style that suits them or they like it. In the teaching process, the theoretical knowledge is explained and excellent cases are displayed on the projector, and the students' design behavior is stimulated by the stimulation of students' visual senses.

1.1 Teacher teach students about the definition of product design at home and abroad , and trace the origin of product design.

1.2 Teachers show students the ancient and modern and excellent product design cases at home and abroad to stimulate students' sensory experience.

1.3 Before learning how to do product design, teachers will teach students how to do preliminary research. First determine the service population of the product, what problem is to solve; Secondly, the information skeleton of the product should be constructed; Then prototype the product (appearance, interaction, function); Finally, the product is modeled.

1.4 Teacher teach students the tools and means needed for product design and students can choose their own tools according to their own needs. Because CorelDRAW is a familiar product drawing software for students, teachers focus on the following aspects of teaching 3dmax: 1. Creating standards and ontologies. 2. Two-dimensional modeling basic graphics. 3. How to convert a two-dimensional object into a three-dimensional figure. 4. Advanced modeling in 3D objects. 5. How to import the Material Editor. 6. How to render the output.

1.5 Teacher teach students different product design methods and design styles, and students can choose their favorite or suitable concepts for the current design environment to apply to their own design works in some excellent cases.

Step 2 Discussion

In the following discussion stage, in the study of basic knowledge, students give their own judgments on a series of questions such as "why this style appears" and "how to choose a design style that suits you", students express their own views and opinions on some excellent cases, and explain the knowledge learned in the teaching of basic knowledge and can be applied to their own design concepts. In the discussion stage, students' understanding of design styles and design tools is based on the knowledge they have learned before, and teachers give appropriate evaluations and analyses through students' speeches, and students can also exchange the knowledge they have discovered to integrate them.

2.1 Students summarize what they have learned in basic learning and discuss with their teachers and ask questions.

2.2 Students discuss what shortcomings existed in previous design works, what advantages they learned in the study of basic knowledge, and how to correct them in subsequent design works.

2.3 Students discuss the problems they have learned in the design process, and what mistakes these problems will cause in the process of designing works, and at the same time ask questions about what they don't understand in the learning of basic knowledge, and teachers can answer and demonstrate according to the questions and questions raised by students.

2.4 At the end of the discussion phase, the teacher summarizes the questions raised by the students and the design concepts learned, and continuously follows up and optimizes.

Step 3 Thinking

After discussion, the students' design concepts were updated, and the previous gap in product design was filled through the study of basic knowledge. In the next thinking stage, students should summarize the conclusions reached in the discussion stage, have a preliminary plan for their next design works, think about how to determine how to suit their own design theme and style, what design means to use, determine what kind of design theme is in line with the current situation, and choose what they are good at or like in the choice of design tools. Because the teacher has already answered the questions raised by the students during the discussion stage, the students can think about whether it will help them in the design they will carry out at this stage, and after the thinking work, the students can draw up a sketch and discuss it with the teacher.

3.1 After discovering and discussing the problems, students have a deeper understanding of the basic knowledge of product design, and can study their own design style in a targeted manner, which not only broadens their knowledge, but also sublimates the design concept.

3.2 After the discussion, students can think about and determine their own design theme and design style, the theme must be in line with the current design environment and concept, and the theme is determined and submitted to the teacher for improvement.

3.3 After determining the theme, students should think about creative methods and tools, such as using Adobe Illustrators, 3dmax or CorelDRAW in the computer to create, you can also try hand-drawn creation in a hand-drawn board, or detach from electronic products for hand-made in the traditional sense.

3.4 The teacher counts the themes and creative tools identified by each student, and proposes suggestions for improvement.

Step 4 Planning creation

After the preliminary preparation, students need to clarify the audience of the creative topic and determine the shape/material/size/creative method according to the audience, such as tables and chairs, mice, and even electronic devices. Next, students can create topics based on the strengths and weaknesses of good cases learned in basic learning, not limited to commercial products, home products, or the use of creative tools.

4.1 Students first clarify the design ideas and audiences, transform the theme drafts determined in the thinking session into the required design tools, and use the shapes, sizes, materials and design elements present in the product to create as the foreshadowing of the overall work.

4.2 Secondly, it is necessary to clarify the audience to be targeted in the design, and organically combine the geometry of the same material. For example, in the product design, choose metal that conforms to modern technology, or wood materials that meet the needs of middle-aged and elderly people.

4.3 In the process of product design, the advantages of drawing on excellent cases will be applied to their own design works, and the concept of independent learning and independent design will be fully utilized. Therefore, everyone's design works have their own style embodiment.

4.4 After the basic creation is completed, students should think about how to convey information to the audience, first of all, a complete and perfect design method expressed in traditional aesthetics, which will be appreciated, read and remembered by the audience; The second is in a novel or surprising way. A good design work is not only good looking, but also think about how to catch the audience's attention, match the appropriate copy, and make your design work complete.

Step 5 Summary analysis

After students complete the creation of their works, they should first explain their design concepts and design processes and the troubles encountered in the design process, and then students will conduct self-evaluation, mutual evaluation between students and evaluation by teachers. Secondly, students talk about what their abilities have improved in this course and what needs to be

improved. Finally, the teacher compared and analyzed the students' previous design work and summarized the inadequacy.

5.1 Students begin by presenting their work to other students and teachers, and explain the design philosophy and design methodology, as well as what troubles existed in the design process.

5.2 Students self-evaluate their design works, students can evaluate each other, and then the teacher will give corresponding scores after comments (according to the novelty of the students' design theme, the rationality of the design layout, the proficiency in the use of design elements, and the use of production means).

5.3 Teachers compare the changes of students' design ability before and after applying nondirective teaching theories, and analyze the advantages and disadvantages in the design process and the points worth learning.

5.4 Finally, the teacher summarizes and analyzes what has been learned throughout the course and counts the student’s degree of excellences.

measurement and Evaluation

1. Assignment form and checking
2. Observe the practice of product design

Instructional Media

1. Teachers self-test and self-evaluate
2. Teachers use computers and projectors to teach, and students use computers to create.

Training Schedule: Product design

Date/time	Teaching Process	Remark
Day 3		
08.30 – 09.30	Pre-test Multiple choice and practice test “product design”	1 hour
09.30 – 11.00	**Introduction** **Lecture** Basic knowledges, Design concepts and skills, Discussion **Leaning and practice:** Hands-on process and practical exercises	1.5 hour
11.00 – 12.00	**Learning Activity:** Nondirective teaching theory have 5 steps 1) Study	1 hour
12.00 – 13.00	Lunch Time	
13.00 – 13.30	2) Discussion	30 minutes
13.30 – 14.00	3) Thinking	30 minutes
14.00 – 15.00	4) Planning creation	1 hour
15.00 – 15.30	5) Summary analysis	30 minutes

Assessment form for Validity of the activity plan

Research Title: The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students

Directions:

Please assess the congruence between components of activity plan based on nondirective teaching theory by putting ✓ in the box according to the following criteria.

Rating is +1. There is an opinion that "consistent to relevant."

Rating is 0. There is an opinion that "Not sure it consistent to relevant."

Rating is -1. There is an opinion that "Inconsistent with relevant."

No.	Questions	Assessment Results		
		+1	0	-1
1	The content is related to the learning objectives.			
2	The learning objectives are consistent with the subject matter.			
3	The Learning Processes are related to teaching.			
4	The Learning activities are related to nondirective teaching theory.			
5	The assignment of work related to the subject of learning.			
6	There are various assessments related with learning objectives.			
7	The measurement and evaluation related with Learning objectives.			

Directions:

Please assess the development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students by putting ✓ in the comment level box below.

5 = Most suitable

4 = Very suitable

3 = moderately suitable

2 = Less suitable

1 = least suitable

Item	Assessment Item	5	4	3	2	1
1.	Learning objectives sort the contents from easy to difficult.					
2.	The nondirective teaching theory are great for encouraging students to think creatively.					
3.	Determining content suitable for the age of students.					
4.	Organizing activities suitable for learning objectives.					
5.	Learning activities can actually improve visual communication design ability					
6.	learning activities linked from basic knowledge to learning from working independently in creative thinking					
7.	The using teaching media are suitable for learning activities.					
8.	The duration of the activities is suitable for the improve of students' visual communication design ability					
9.	Measurement and evaluation are suitable for learning activities to develop real abilities.					
10.	Assessment criteria are appropriate for objective learning.					

The item test for testing with sample students

	The item Questions
Poster design	1. What is the purpose of designing a poster? a) Strong visual impact and outstanding features. **b) Deepen consumers' impression of the product.** c) Obtain better publicity results. d) Establish a brand image.
	2. What is the most basic design dimension in poster design? a) 30 inchesX20 inches b) 30 inchesX50 inches **c) 60 inchesX30 inches** d) 10 inchesX20 inches
	3. What are the operations that cannot be performed in the vector software CorelDraw? a) Stable color output b) Variable contour tool c) Document preset thumbnails **d) Cyberpunk**
	4. How many degrees are the twenty-four hue rings apart from each hue? a) 20 b) 10 c) 15 **d) 25**
	5. Which of the following options is not a design principle to follow in poster design. a) The theme is clear b) The number of products can be excessive c) Arouse the desire to click in the shortest amount of time **d) The amount of information is balanced**
	6. Which of the following types can posters be divided into according to their applications? a) Cultural posters **b) Movie poster** c) Public welfare poster d) Holiday poster
	7.What parts do a good poster work consist of? **a) Title** b) Image c) Color d) Text

Poster design	8.How to use color to express emotions in poster design? a) Use warm colors to express the softness of the subject b) Use solid blocks of color to express the vividness of the subject **c) Use blocks of contrasting colors to catch the eye** d) Use cool colors to express the heaviness of the subject
	9. How to reinforce the theme in the poster design? a) Concentrate or feature up locally b) Increase the contrast of visual features c) Use color jumping color blocks **d) Weaken surrounding auxiliary details**
	10. How can I design a poster that suitable for marketing? **a) Determine the poster theme** b) Determine the dominant color c) Layout text and images d) Determine the content of the copy
	11. Stitch together two scenes that have similar shapes but are not the same to create a composite scene. Using this kind of creativity gives the design a sense of mixing and matching and traveling through time. What is this creative design approach? a) Double exposure b) Substitution techniques **c) Heterogeneous isomorphism** d) Collage fusion
	12. What new layer's layer mode can be obtained by merging the Filter and Highlight layers? **a) Color filtering** b) Bright light c) Normal d) Up in the air
	13. If you want to design a movie poster how to design first? a) Writing b) Figure **c) Graphics** d) Large areas of white space
	14. How to understand Pop Design style? **a) The shape is exaggerated and the visual impact is strong** b) Pursue popular, popular fun c) Emphasis on novelty and uniqueness d) It is difficult to determine a uniform style

Sign design	1. What is the purpose of designing a sign? a) Unify the company's image and improve memory. **b) Give the business a special identification.** c) Spread the culture of the company through visual symbols. d) Inspire people to evaluate its quality and value.
	2. What are the three elements of logo design? **a) Graphic,text,creative** b) Text,material,creative c) Graphic,text,composition d) Graphic,text,color
	3. Which art movement in the Western world in the 19th century drove the advancement of sign design? a) Art Nouveau b) Art Deco movement **c) Arts and Crafts movement** d) Art movements during the Industrial Revolution
	4. Which of the following options is not a triad in sign design? a) Name **b) Background** c) Pattern d) Color
	5. What are the disadvantages of using Photoshop for sign design? a) Edges are jagged b) Blurry the image **c) Produces color shifts** d) It needs to be vectorized before it can be used
	6. What parts do a good sign work consist of? a) Writing b) Image **c) Color** d) Text
	7. How to use color to express emotions in sign design? **a) White - innocent, clean, bright, white, snowflake.** b) Black - silence, despair, misfortune, seriousness. c) Red - sun, urgent, energetic and positive. d) Gold - honor, wealth, loyalty.

Sign design	8. Which of the biggest feature performance technique in sign design is to keep the center of gravity stable, giving people a psychological feeling that does not lose the center of gravity, compared with "symmetry", it appears free, vivid, lively and changeable? a) Conciliation b) Contrasting c) Rhythmic **d) Balanced**
	9. How to reinforce the theme in sign design? a) Brand overview b) Brand tonality c) Logo application **d) Image style**
	10. How to design a sign that suitable for marketing? a) Determine the topic **b) Pre-research** c) Concept generation d) Make a sketch
	11. How to explain plain text signs in sign design? a) Treat a word with a unique eye-opening b) Unable to convey the message in detail c) Make the brand image more recognizable **d) Creative design of the text reaches the image point of shape and meaning.**
	12. How to innovate sign design ideas and methods? **a) Creative design based on the initials of object names** b) Visual creative design c) Associative creative design d) Creative design of social characteristics
	13. How to understand negative space design style? a) In order to enhance the layering and movement of the picture. b) Large area entities appear, leaving a small area of negative space. **c) Arc negative space appears.** d) It has strong directionality and visual guidance.
	14. How to determine what design methods should be used in your sign design work? **a) Clarify corporate image.** b) Determine customer preferences. c) Identify business audiences. d) Whether it meets the design needs of today.

Product design	1. Which of the following options is a principle of user-friendly design in product design? **a) Focus on real people "audiences** b) Find the right question c) Think of everything as a system d) Always test design decisions
	2. Which of the following options is an essential component of product styling design? a) Dots, lines, polygons **b) Geometry** c) Space d) Writing
	3. What are the basic ideas that the product design process should follow? a) Ask questions - analyze problems - solve problems b) Coordination and unification of the product as a whole **c) The integration of technology and art, the unity of sensibility and reason** d) Discover people's needs and problems in life and work
	4. What is the purpose of designing a product? a) Realize business value b) Realize human values c) Realize the improvement of social system **d) Achieve rapid scientific development**
	5. How many types of product design can be classified? a) Mechanical equipment design **b) Electronic product design** c) Product packaging design d) Household product design
	6. What is the mean of Product Concept design? a) Stay at the conceptual level b) It is not necessary to be realizable c) Helps determine the best design layout **d) Express the author's thoughts on a certain field and his imagination for the future.**
	7. What added value of the product is improved by product design? a) Refinement of the outer packaging b) Differentiation in terms of materials and materials **c) Features and highlights of the product** d) Practicality of the product

Product design	8. How to make a basic classification of product engineering materials? a) Metallic materials,/Non-metallic materials **b) Natural materials/Composite materials** c) Organic materials/Inorganic materials d) Linear material/Block material
	9. How do you understand product design in Dutch Style? **a) Strip away traditional features entirely** b) It is mainly red, yellow and blue c) Explore an expression of the pure spirituality common to humanity d) Use the simplest geometric form
	10. How do you understand bionic design? a) The convergence point between human social production activities and natural world b) Imitation of living things **c) Use the structural and functional principles of living things to design the design method of product machinery** d) Dominate nature
	11. How to decide what materials to choose in the product design? a) Natural, light weight-Wood material b) High performance, low cost-Plastic material c) Color diversity-Metallic **d) Colorless transparent-Glass material**
	12. Why is the mouse designed with a "streamlined" design? **a) Conforms to the curvature of the palm** b) Convenient and lightweight c) Easy to carry d) Strong sense of click
	13. How to position a product? a) Target market positioning **b) Product demand positioning** c) Product test positioning d) Differentiated value point positioning

Assessment form of the performance test

content	The item Questions	Assessment Results		
		+1	0	-1
Poster design	1. 2023 is the 20th anniversary of the founding of the China-ASEAN Expo. Students will design posters with the theme of "ASEAN 20th anniversary". The design works should focus on the "home era" and reflect the concept of" co-operation and sharing, harmony and symbiosis and common destiny.			
	2. The cultural identity of the world is rich and full of human diversity, yet the craftsmanship of social processes clearly wears away the respect we deserve. How can linguistic diversity be passed on? Returning to the basics is fundamental! Students designed posters on the theme of "Roots: Maintaining and Respecting Global Cultural Identity".			
Sign design	1. With the theme of "ecological protection, harmonious development and promotion of ecological civilization" it fully reflects the ecological characteristics and construction effects of Lalu Wetland National Nature reserve. Students start with the design from the concept and analysis of sign works.			
	2. With the beauty of thought, art, design and culture, innovate the national publicity sign image of domestic waste classification, so that the "new fashion" of garbage classification carries the new concept of green development and shapes a harmonious and beautiful new life. Students designed the sign with the theme of publicizing the new concept of municipal solid waste classification, soliciting good ideas for municipal solid waste classification, and lighting up the new trend of municipal solid waste classification.			

content	The item Questions	Assessment Results		
		+1	0	-1
Product design	1. With the theme of “Bamboo Gathering the World, Happiness and Politics”. Based on bamboo resources, students excavate the cultural connotation of “bamboo” for product design and comprehensively consider the production process, marketability, functionality, innovation and other aspects of their design works.			
	2. Students take plush toy products as the design object, encourage the absorption of international, diversified and fashionable cutting-edge design concepts, and in accordance with the concept of "everything can be plush", pay attention to strengthening the combination with artificial intelligence, trendy toys, animation film and television, historical relics, Chinese traditional culture, red culture, local characteristic culture and local city image, to create good works that conform to the main theme of the times, enhance Chinese cultural self-confidence, and are favored by the market.			

Appendix F
Certificate of English

BANSOMDEJCHAOPRAYA
RAJABHAT UNIVERSITY

This is to certify that

Mrs.Sai Luo

Achieved BSRU English Proficiency Test (BSRU-TEP) level

C1

Given on 3rd October 2020

(Assistant Professor Dr Kulsirin Aphiratvoradej)

Director

Appendix G
Research Article Response Form

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SPU: 0203/4299

17 October 2023

Title: Paper Acceptance

Dear Luo Sai

On behalf of the Organizing Committee and Peer Review Committee, we are pleased that your paper titled,

"The Development of Training Course based on Nondirective Teaching Theory to improve Visual Communication Design Ability of Undergraduate Students"

submitted for presentation at the 18th National and the 8th International Sripatum University Conference (SPUCON2023) on Research and Innovations to Sustainable Development, held on 27 October 2023, is formally accepted for inclusion in the conference program.

The conference program is shaping up to reflect a wonderful event. We hope that you will be able to fully participate in the conference and take advantages of all the benefits that this conference offer participants and attendees. Besides, your presented paper will be published in the on-line proceedings which will be available at http://spucon.spu.ac.th

We are looking forward to meeting you.

Sincerely yours,

Y. Sulein

(Assoc. Prof. Subin Yurarach, Ph.D.)
Chairman of Peer Review Committee
SPUCON2023

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The Development of Training Course based on Nondirective Teaching Theory to improve Visual Communication Design Ability of Undergraduate Students

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ABSTRACT

The objectives of this research were 1) to develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students and 2) to compare students' visual communication design ability before and after training course based on nondirective teaching theory. The sample group were 38 fourth-year students in fine arts major of the State University in the second semester of the academic year 2023. Through cluster random sampling. The research instruments involved 1) Activity plan according to the nondirective teaching theory and 2) Visual communication design ability test (multiple-choice test and performance test). Data were statistically analyzed by mean, standard deviation, and t-test for dependent samples. The findings were revealed that:

1) The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students has synthesized into 5 steps: 1. Study stage, 2. Discussion stage, 3. Thinking stage, 4. Planning creation stage, and 5. Summary analysis stage, as well as taking used to develop an activity plan. The results are shown the quality of the activity plan by experts overall had the most suitable. 2) The comparison of students' visual communication design ability before and after learning by using nondirective teaching theory of undergraduate students. The results were found that after the experiment was higher than before the experiment statistically significance at the level .01. The using nondirective teaching theory increase students' visual communication design ability.

KEYWORDS: Visual communication design ability, Nondirective teaching theory, Undergraduate students

1. Introduction

Visual communication design is a discipline that reflects the social development situation and constantly leads the social lifestyle, and also constantly innovates, keeps up with the trend of the times, advocates innovation and vitality, and is closely related to social life. From the current development point of view, the development of visual communication design education in the country is constantly expanding, and the society's demand for talents is also increasing, and it is urgent to solve the existing main contradictions in talent training. (Chen, 2014). Visual education in the most intuitive way to hands-on education can help students improve their practical ability to better understand their own development direction. However, the traditional visual communication design teaching concepts, content, methods, models and methods are still following the existing routines in the past,

breaking away from the existing social reality, and failing to provide timely and effective professional guidance to students. (Li, 2017). The visual communication design major should break the previous closed teaching, extend the classroom from time and space, and create a free learning environment for students.

The teaching of visual communication design is more focused on theoretical teaching, which makes students passively accept various theoretical knowledge in the classroom, and lacks the process of independent thinking and self-practice. At present, the teacher-centered classroom is no longer suitable for college education, and this teaching model not only does not get students to be qualitatively improved, but the whole classroom is also boring and lifeless. Teachers do not have enough understanding of the thinking guidance and self-construction of students majoring in visual communication design, which is not enough to support them to learn and give full play to their professional skills. (Zhang, 2018). The educational and teaching achievements of visual communication design major are inseparable from teachers teaching innovation mode, pioneering thinking and students' consciousness of independent research and creative creation.

Using nondirective teaching theories can optimize the concept of curriculum education, and no longer limit teaching to the teacher himself and boring knowledge; Students can discover their own strengths and weaknesses in the classroom, and discover their own shortcomings; At the same time, you can also speak freely, express your true thoughts, and stimulate your interest in design, rather than blindly designing for design; The teacher's role in the classroom is that of a facilitator rather than a leader. Wang (2017) summarizes in that. Learning, teachers are merely advisors, participating in discussions at the request of students, rather than instructing or non-operational. The visual communication design major should break the previous closed teaching, extend the classroom from time and space, and create a free learning environment for students. Teachers can not only choose the teaching space according to the teaching content, but also change the rigid teaching methods in the past, guide students to change from passive learning to active learning, and then stimulate their creative thinking, further cultivate students' communication ability and independent learning ability, and enhance students' ability to analyze and solve problems.

In summary, the traditional visual communication design classroom needs to be innovated to strengthen students' practical ability and achieve the purpose of students guiding the classroom. At the same time, non-guiding teaching theory is suitable for all stages of current visual design teaching, which not only enables students to become the leader of the classroom, learn to learn actively, stimulate their inner interest in learning, but also improve their visual communication design ability and independent thinking ability. It can be seen that this teaching method is positive and effective. Therefore, researchers are interested in improving students' visual communication design ability through nondirective teaching methods, thereby improving students' interest and achievement.

2. Research Objective

(1) To develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students.

(2) To compare students' visual communication design ability between before and after training course based on nondirective teaching theory.

3. Literature Review

3.1 Training course

The training course is mainly based on training and the trainees can master a certain skill through training, observation, etc. The training is primarily skills-based, with a focus on behavioral practice. In order to achieve unified scientific and technological specifications and standardized learning, through modern information processes such as goal planning and setting, knowledge and information transmission, skill proficiency exercises, homework, and achievement evaluation. Trainees can achieve the expected level of improvement goals, improve personal ability and work ability through certain means. As Peter (2003) said about training courses: It is an important part of various development projects. Good training helps participants gain new knowledge and skills. and the attitude that will help them put these things into practice to change their situation. And Hu (2019) said that training courses in the information age technology can be used as a new component of teacher training content. It can also be used as a new way to support teacher training. By providing strong support to teacher's professional development.

Nondirective teaching theory

Nondirective teaching theory, also known as humanistic teaching theory, it is a teaching theory that arose in the United States in the 1960s, and its representative figure is the American humanistic psychologist Rogers. In 2014, the theoretical knowledge involved in the teaching model was re-summarized and updated. "Nondirective teaching theory" emphasizes that everyone has the motivation to learn and can determine their own learning needs; teaching must be student-centered; teachers are the facilitators who help students explore life; and the ultimate goal of teaching is to promote the development of students' personality. "Nondirective teaching theory" not only had an impact on the educational practice and educational theory in the United States, but also played a positive role in promoting the development of education in other countries, including China. Zhang (2006) said the core of Rogers' theory of "nondirective teaching" is people-oriented, focusing on people in the teaching process, that is, respecting people, understanding people, and caring for people; Focus on human development, that is, emphasize human value and develop human potential; Classroom teaching does not stop at the level of memorizing knowledge, but promotes constructive changes in personality through the transmission of knowledge. Gu (2009) said: Rogers' humanistic-centered nondirective educational philosophy pays full attention to students, to the growth of students as a whole personality, to students' meaningful learning and learning to learn, and to teachers as facilitators of learning.

Visual communication design ability

Visual communication design ability is an active act of communicating a particular thing through visual forms. Most or part of it relies on vision and is represented in the image of two-dimensional spaces such as logos, typesetting, painting, graphic design, illustration, color and electronic equipment. Visual communication design ability meaning is: good design the work not only has its "shape" because of its exquisite production, but also has "god" because of the support of profound cultural heritage, "both form and god" can truly be called an excellent design work, and only such works can truly realize the beautification of public life and improve. The importance of having high professional theoretical literacy also lies in being able to grasp the inherent laws of design,

consciously use theory to guide practice, and transform spontaneous design behavior into conscious creative activities. The so-called "visual symbols", as the name suggests, refers to the human visual organs - the eyes can see the symbols that can express the certain nature of things, such as photography, television, movies, plastic arts, buildings, various design products, urban architecture and various sciences, texts, but also including stage design, music, heraldry, ancient coins, etc. are all seen with the eyes, they all belong to visual symbols. Wang (2020) said visual communication design is a subject with strong practicality and application. This major requires students to have certain innovative thinking and innovative ability. Huang (2021) said professional design ability is the first requirement that a professional designer must have. In China's current visual communication design major, many students are overly valued and rely on computer technology, and they understand excellent professional design ability as proficiency in computer software. It is true that proficiency in computer technology itself is understandable and a necessary ability.

Measurement and Evaluation

The standardized tests involved in the process of measurement assessment and evaluation enables the students to make better use of the data available in the daily classroom. It offers learners with an understanding of the role of assessment and evaluation in the instructional process. Measurement assessment and evaluation also helps the teachers to determine the learning progress of the students. Without measuring and evaluating their performance, teachers will not be able to determine how much the students have learned. Dylan (2016) said Michael Scriven first proposed four types of classroom assessment in his research: positional assessment, formative assessment, diagnostic assessment. 1) Positioning assessment: Also known as placement assessment, preparatory assessment. It is mainly evaluated before specific teaching activities to determine students' preparation. 2) Formative assessment: It is an evaluation carried out in the teaching process, which is an assessment of students' learning results and teachers' teaching effects to guide the correct and perfect progress of the teaching process. 3) Diagnostic assessment: It is mainly to further evaluate the teaching background and all aspects of the student's situation, and it focuses on the in-depth investigation of repeated mistakes in students' learning. 4) Summation assessment: It is an evaluation that judges the degree of achievement of the entire teaching goal after a relatively complete teaching stage. A summative assessment can use a variety of tests at (Roediger & Marsh, 2005) proposed a multiple-choice question format, which is a type of question or method of selecting one or more options as the correct answer. The questions also have different characteristics from other types of multiple-choice questions: First, it can measure knowledge and ability at multiple levels such as memorization, understanding, analysis, and synthesis; Second, it can control the guessing behavior, because it is not the only correct option, the combination of options is varied, students cannot score based on guessing alone, only have a certain ability to ensure that the choice is correct; and Third, its scoring rules are fixed and consistent, with high reliability, and convenient scoring, which is conducive to the realization of computerized tests. In this research to use the multiple-choice test, with 4 choices, for measurement knowledge and develop performance tests was authentic assessment (holistic rubric) the scoring criteria used to measure the visual communication design ability for 5 scale.

3.2 Research Framework

Visual communication design is a subject with strong practicality and application. This major requires students to have certain innovative thinking and innovative ability (Wang, 2020). In China's current visual communication design major, many students are overly valued and rely on computer technology, and they understand excellent professional design ability as proficiency in computer software. It is true that proficiency in computer technology itself is understandable and a necessary ability (Huang, 2021). The researcher has studied the documents and research related to nondirective teaching theory from many researchers: Rogers (1969); Maryam Hasan (2013); Lu Mingjuan (2019); Guan Xin (2020). In this research, researcher has synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students and defined as a framework for research concepts as follows:

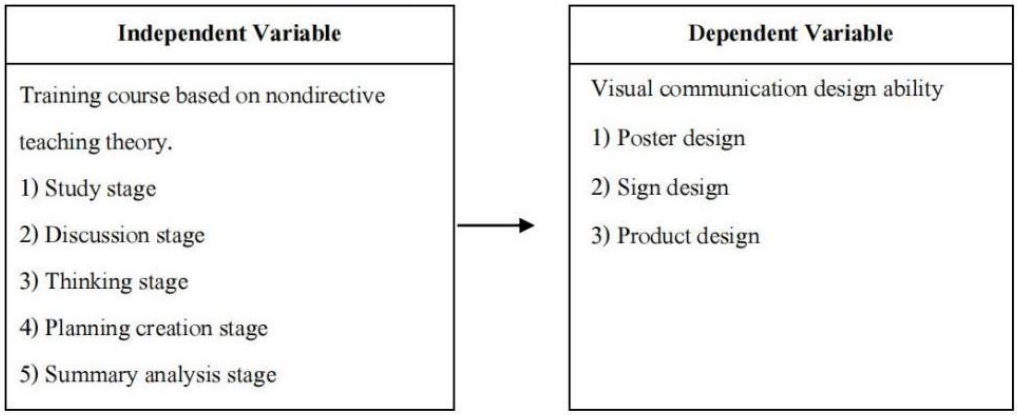

Figure 1 Research Framework

3.3 Research Hypotheses

After the training course based on nondirective teaching theory, the students have improved visual communication design ability explicitly.

Hou (2002) This research report, 36 students from the Art Department of Chengdu Institute of Education were selected for teaching experiments. In unguided teaching, the basic task of the teacher is to allow students to learn on their own, so that they can satisfy their curiosity and thus achieve a sense of success. Teachers need to help students understand what they want to learn, discover what they can do themselves, provide learning resources, help students learn the means to use, and decide for themselves how to learn. Huang (2021) This paper investigates and studies the visual communication design major of Hainan Tropical Ocean University the learning status of 56 students in the sophomore year, combined with the background of "Internet + education", proposed a teaching reform strategy for visual communication design. This study concludes that under the background of the "Internet + education" era, the previous school education model is being challenged, and the targeted and personalized feedback and services provided by the Internet make the formation of a personalized lifelong education system possible. The universality and equity of education also make the threshold for inter-professional getting lower and lower. Nondirective learning can not only help students improve their interest in visual communication design, but also cultivate good self-directed learning habits.

4. Research Methodology

4.1 Research Design

This research was experimental research. The researcher conducted the experiment using a single group experimental design. Test before experiment and posttest (One Group Pretest–Posttest Design), as shown in table 1.

Table 1 Experimental design

Group	Pretest	Experimental	Posttest
R	O_1	X	O_2

The meaning of the symbols used in the experimental design.

R means Random Sampling

X means experimental

O_1 means Pretest

O_2 means Posttest

4.2 Population and Sample

The Population: There were 912 fourth-year students from 24 classes in fine arts major of the State University in the second semester of the academic year 2023 (There were student's mixed ability, high level, medium level and low-level abilities.)

The Sample group: There were 38 fourth-year students from 1 class in fine arts major of the State University in the second semester of the academic year 2023. Through cluster random sampling from 1 class, each class has student's mixed ability, high level, medium level and low-level abilities.

4.3 Research Instrument

The development of training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students. The researcher has studied the documents. Research related from many academics: Karen Cozzie (2013); Lisa Evans (2020); Madison Boehm (2022); and Javaid Arshad (2023). In this research, the researcher has synthesized 5 stages: 1) Study stage, 2) Discussion stage, 3) Thinking stage, 4) Planning creation stage, and 5) Summary analysis stage. The research instruments follow: 1) Create 3 activity plans according to the development of training course based on nondirective teaching theory, 15 hours, and 2) Visual communication design ability test (multiple-choice test and performance test).

1) An activity plan had an IOC consistency index greater than or equal to 0.50, so it was considered suitable for use in research. The result of the Index of Item Objective Congruence (IOC) analysis of this activity plan has an IOC = 1.00 for all questions.

2) The multiple-choice test can measure knowledge and ability at multiple levels, the result analysis of quality 41 items was IOC=1.00 for all questions, difficulty value (p) in the range of 0.29-0.71 and discrimination power (r) in the range of 0.21- 0.53. and reliability (KR-20) = 0.79. And creating design performance tests for 3 contents, several 6 items can recheck student's knowledge to used them work, the result analysis was IOC=1.00 for all questions.

4.4 Data Collection

This research was divided into 3 phases, the details are as follows.

1. Pre-experiment phase: 1) Organize an orientation before starting the experiment to understand students how to study student role learning objectives evaluation method and the benefits that will be gained from taking the ability test and learning activities during the experiment. 2) Test before teaching (Pre-test) with fourth-year students in fine arts major of the university in the second semester of the academic year 2023, the number of 38 people, which is a sample group, and check the score record in order to analyse the data.

2. Experiment phase: The experimental phase is the phase in which the sample group learns using the activity plan developed by the researchers based on the nondirective teaching theory. The teaching time on 4th July - 7th July total of 15 hours, not counting the days of pre-test and post-test.

3. Post-experiment phase: After all the content has been taught, a proficiency test is given to a sample group of students. Test after learning (Post-test), and then check and score according to the scoring standards formulated by the researcher. Once the scores have been reviewed and combined, the scores are submitted for further data analysis.

4.5 Data Analysis

The researchers analyzed the data. Using the Excel program, the order in which the data were analyzed was quantitative data were analyzed through descriptive statistics; means, and standard deviation. And data were analyzed through inferential statistics; Then calculate the different score of learning ability before and after using instructional model were analyzed through t – test for dependent sample.

5. Research Findings

This research was to develop the training course based on nondirective teaching theory to improve visual communication design ability of undergraduate students and to compare students' visual communication design ability between before and after training course based on nondirective teaching theory of undergraduate students. The data analysis result can be presented as follows:

1. The development of training course based on nondirective teaching theory to improve the visual communication design ability of undergraduate students, the research has studied the documents and research related to nondirective teaching theory from many researchers and synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students. The data analysis was assessment of the quality of the activity plan according to nondirective teaching theory by 3 experts, the results of the quality of the activity plan by experts overall has the most suitable.

2. The comparison of students' visual communication design ability between before and after training course based on nondirective teaching theory of undergraduate students as follow table 2.

Table 2 The comparison of visual communication design ability score between before and after learning

Visual communication design Ability	Testing	Score total	$\bar{X}$	SD.	t	p
Poster design	Pre-test	24	11.89	1.09	38.07**	.00
	Post-test		18.50	0.98		
Sign design	Pre-test	24	10.95	0.89	33.53**	.00
	Post-test		18.37	0.59		
Product design	Pre-test	23	10.97	1.13	36.08**	.00
	Post-test		17.50	0.76		
Total	Pre-test	71	37.97	2.99	48.92**	.00
	Post-test		61.10	1.99		

**Statistically significant .01 level ($p<.01$)

From table 2, the comparison of students' visual communication design ability before and after learning by using nondirective teaching theory of undergraduate students. The results are shown the average score before learning was 37.97, the average score after learning was 61.10. The results were found that after the experiment was higher than before the experiment statistically at significance level .01.

6. Discussion

Research results on the development of visual communication design abilities 38 fourth-year students in fine arts major of the State University in the second semester of the academic year 2023 by using nondirective teaching theory can be discussed as follows.

The development of training course based on nondirective teaching theory to improve the visual communication design ability of undergrad students. The research has studied the documents and research related to nondirective teaching theory from many researchers and has synthesized into 5 steps used to develop an activity plan according to the nondirective teaching theory of undergraduate students. The data analysis was the assessment of the quality of the activity plan according to the nondirective teaching theory by 3 experts, and the results are shown the quality of the activity plan by experts. Learn completely related the content is clear and comprehensive. The activities that are established emphasize that learners can actually learn, practice thinking, and practice in terms of teaching media. In terms of measurement and evaluation is determined to be an assessment based on actual conditions and to measure according to the learning objectives and in determining the work piece and workload are appropriate in accordance with the learning objectives, which is consistent with the research (Guo, 2020) and (Huang, 2021), through the development of actual activity plan cases based on nondirective teaching theory to examine the student visual communication design outcomes of nondirective teaching theory that are fully applied to actual teaching. In addition, Rogers (1969) emphasis on learning based on nondirective instruction is the standard for student-directed learning. In (Lu, 2019), the result shows that the nondirective teaching theory emphasizes that everyone has a natural tendency to healthy development, and that interpersonal relationships full of sincerity, trust and understanding will contribute to the stimulation of students'

potential. The teaching process of nondirective teaching theory generally consists of 5 steps. In different literature, the development and implementation of nondirective teaching theory have further details.

The comparison of students' visual communication design ability between and after learning by using the nondirective teaching theory of undergraduate students. The results are shown the average score before learning was 37.98, the average score after learning was 61.11, and the mean difference was 23.13. The results were found that the visual communication design ability of students after learning higher than before learning statistically significant at the .01 level, which was in accordance with the hypothesis. The theory of nondirective teaching adheres to the student-centered teaching concept, advocates the meaningful free learning concept, promotes the self-realization of the teaching goal concept, and the equal and harmonious teacher-student concept. This is the same as (Yin & Tang, 2018). Meanwhile, this kind of teaching can not only expand students' thinking, stimulate students' interest in learning, but also fully play the main role of students from the perspective of students' psychology, so that students can continuously improve their design ability in the process of independent learning. The research concludes that "student-centered" is the main educational idea of nondirective teaching, and the study of nondirective teaching is to develop students in an all-round way under the guidance of modern educational concepts; this is consistent with (Shi, 2012). As a result of the ordinary method to the first group, students' achievement grades increased by approximately 9 points; as a result of the nondirective teaching theory applied to the second group, students' achievement grades increased 23 points approximately, and the results show that nondirective teaching theory has a positive effect on students' success and that choosing the proper teaching method suitable to students' individual interests and abilities is very important.

In conclusion, this paper has shown that nondirective teaching theory can be used as an effective teaching strategy to create a student-centered learning environment in the visual communication design class. The principle of "nondirective" teaching emphasizes that students are the center and subject of the learning process, and teachers do not regard themselves as high-ranking instructors, but create conditions for students to learn as equals, trust students, promote a good learning atmosphere, create a safe, harmonious, sincere and open learning environment, and ensure students' psychological freedom to fully think and research, feel the joy of learning, and think independently. If teachers adhere to practice and exploration, think and change while doing, classroom teaching will be rejuvenated. The article can conclude that non-guiding teaching theory can help students clarify how to actively absorb knowledge in future learning, no longer passively absorbed, but transformed into interest. At the same time, the use of non-guiding teaching theories can indeed improve students' visual communication design ability.

7. Suggestion

(1) Sample selection when random sampling is used, the sample of students sampled is not representative of the parent being studied, which may cause problems related to statistical selectivity bias in the study.

(2) Nondirective teaching theories are not commonly used in teaching today, so when conducting research, there is not enough literature related to the research topic. The literature may also be limited due to the different scope of the research topics.

8. Acknowledgement

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