

Research on Teaching Practice of Mongolian Horse Saddle Making

-- Taking the Professional Course Teaching of Inner Mongolia Normal University as an Example

Jun Xi ¹, Battsooj Sukhbayar ^{2, *}

¹ Mongolian State University of Education, Ulaanbaatar, Mongolia

² Doctor of Education Research (PhD), School of Fine Arts and Technology, Mongolian State University of Education, Ulaanbaatar, Mongolia

* Corresponding author: Battsooj Sukhbayar

Abstract: In the life of the Mongolian people, warhorses are undoubtedly the best friends and capable assistants of nomadic tribes. Horses are indispensable in military campaigns, hunting, and daily life. They allow nomads to gallop freely across the vast northern grasslands. As an essential means of transportation, horses hold immense significance. The Mongolians are known as the "horseback nation," so what artifact can represent the pinnacle of nomadic craftsmanship in the context of arts and crafts? Naturally, one thinks of saddles. Saddles are necessities for our lives, and each period of saddle development reflects the highest level of craftsmanship and aesthetic expression at that time. The laws governing the evolution of artifacts have been gradually accumulated through long-term use, selection, discovery, and practice. This includes techniques, materials, shapes, structures, aesthetics, and expressions. These precious objects are the crystallization of national cultural wisdom.

Keywords: Mongolian; Saddle Gear; Teaching; Technology; Materials; Function; Shape.

1. Introduction

The lyrics of the song, "The sky is vast and the fields boundless, the wind blows over the grasslands where cattle and sheep graze," evoke such a beautiful scene. Closing your eyes, you can recall that vast, beautiful prairie where you played as a child. In today's era of rapid digital media development, one can easily browse through countless stunning images with just a smartphone. If students cognitive or knowledge systems are solely derived from mobile phones and the internet, this is truly alarming. In this fast-paced age of digital information, assuming what we see represents the entirety of the world is superficial, lacking depth and practical experience. This vague understanding poses fatal problems for art students in future innovative design projects, leading to homogenized designs, a lack of imagination, and an absence of cultural roots and belonging, which undermines their cultural confidence. Looking back at history, the teaching of arts and crafts at Inner Mongolia Normal University began in 1954, and in 1978, it established a specialized direction in the undergraduate program in Fine Arts, making it one of the earliest such programs in Inner Mongolian universities and the most important base for cultivating talent in arts and crafts in the autonomous region. It has trained a large number of professionals and industry leaders in arts and crafts for the country and eight provinces and regions inhabited by ethnic minorities, contributing significantly to the education of arts and crafts in Inner Mongolia. The industry and its development have made outstanding contributions. In today's globalized world, the clash of diverse cultures can easily lead these students astray, exposing them to foreign influences. Schools bear the responsibility of nurturing the future successors of our country; fostering a correct worldview, values, and outlook on life is crucial. Therefore, remembering historical events, exploring, protecting, inheriting, building, and developing

culture are urgent and most important tasks for every nation. For students in school, cultural inheritance is more important than innovation. Geographically, the nomadic people live on high plateau pastures; those who have not experienced nomadic life cannot truly understand it. Under such harsh, lonely, and brutal natural conditions, the nomadic people developed a broad-minded, emotionally rich, and intellectually wise character.

According to the teaching of basic courses in the Arts and Crafts major, we use forging techniques to start with ring production and processing. First, we conceptualize and draw design plans, prepare materials (such as filigree, gemstones for setting, material sheets, enamel, etc.), then proceed through forging techniques, casting techniques (hand-carved wax), 3D modeling, and other methods to produce finished products. Although the course objectives have been achieved, something still seems missing? Students are relatively satisfied with their works, finding them novel, even if the craftsmanship is not meticulous; at least they have a few complete pieces. After some time, when looking back at these works, we find that compared to the design plans, there is a lack of similarity, characteristics, innovation, and craftsmanship. How much can we score ourselves on this? 1. We believe our designs were not blind, but upon inquiry, the design concepts are very rich. The similarity of the designed images is high, which indicates that the design has failed. Li Chaode wrote in his book "The Cultural Stance of Design—A Study on China's Discourse Power in Design," "On the surface, it appears to be an issue of material manifestation in design graphics, but in reality, it is a cultural demand for lifestyle, taste, quality, and value, hidden beneath the surface of design and built on the foundation of economic development." 2. In terms of craftsmanship, it falls short from the beginning, both in class hours and extracurricular time. The amount of time invested in production is evident. The exquisite gold and silver ornaments we see in museums today

all follow strict manufacturing processes, rigorous skill training, and teaching methods within the master-apprentice or family inheritance system play a crucial role. If the craftsmans skills are not up to par, no matter how good the idea, it cannot be realized, making it zero. This can be clearly seen from the records in the "New Book of Tang: Officials Positions," which states, "The art of inlaying and engraving takes four years to teach." [1] [2]

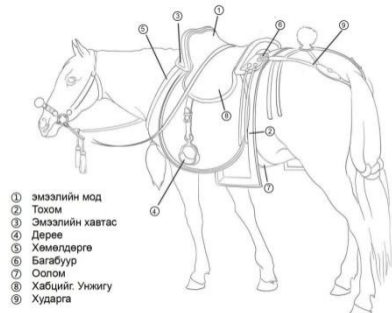


Fig 1. Overall saddle equipment rendering

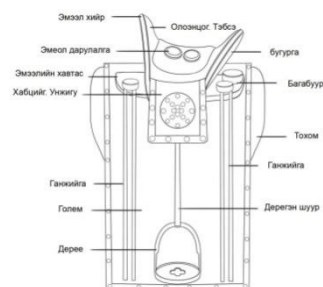


Fig 2. Name of the component of the saddle accessory

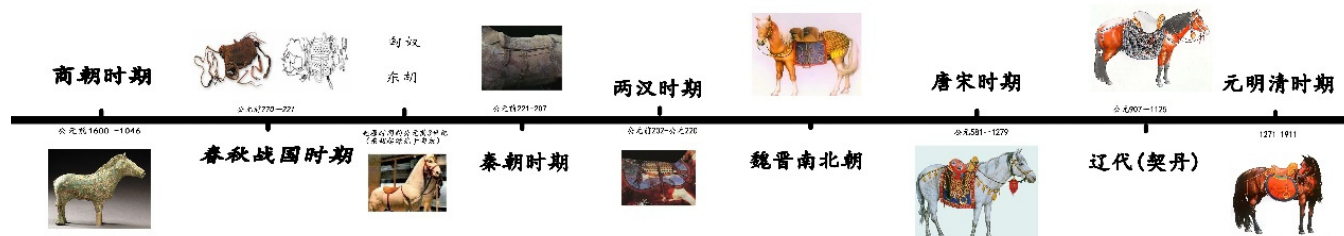


Fig 3. Timeline of the evolution of the saddle (edited by team students)

In the process of practice, we selected stages in the development history of saddles from a vast amount of literature. We focused on two aspects: textual information and archaeological artifacts. Our main research objects were physical items such as murals, sculptures, pottery, and bronze artifacts unearthed through archaeological excavations. We supplemented this with textual interpretation and description to cross-reference and filter out the necessary parts. The "transmission and copying" method in Xie Hes Six Principles is a high-level summary of the theory of tracing. Tracing is not just simple imitation; it serves as a bridge for communication with the souls of our ancestors. The significance of focusing on physical artifacts in our research lies in deepening learning impressions through hand-drawing. The process of tracing and drawing is essentially reconstructing the steps of ancient people. As the saying goes, "Even the smartest brain cannot match a clumsy pen," which highlights the importance of personal experience and hands-on practice. The assignment requirement is 1:1 drawing. For

Inheritance requires dynamic transmission. As the core of the national talent cultivation strategy, universities play a crucial role in this process. The integration of intangible cultural heritage into campuses and the collaboration between schools and enterprises, along with the involvement of master craftsmen and inheritors on campus, form a system for nurturing talent in university inheritance programs. Universities across provinces and cities are flourishing, with diverse forms of cooperation and a focus on regional characteristic crafts. With the support of functional departments at all levels, universities actively advocate incorporating courses such as professional field trips, specialized studies, and internships into their curriculum when developing talent training plans. They also establish good cooperative relationships with local enterprises, cultural centers, museums, practice bases, studios, and inheritors. Taking Inner Mongolia Normal University as an example, after identifying our shortcomings through practical experience, we address specific needs by addressing the gaps. Guided by demand, we explore issues in the curriculum by delving into various aspects of Chinese traditional culture, including the roots of works, forms, patterns, symbols, and meanings. We use methods such as field investigations, market research, interviews, and more to understand the craftsmanship, functions, structural forms, and materials involved. By visiting local museums, collecting materials, reading documents, practicing copying, deconstructing forms, and deconstructing techniques, imitation is one of the simple yet effective learning methods. In terms of division of labor, we work in groups of 3 to 5 people: the document group (Figures 3), the deconstruction group, and the saddle group (Гөлөм) for drawingGroup, metal accessory modeling group, saddle group, stirrup group and so on.

art students, hand-drawing is fundamental because the artifacts are unearthed items, often damaged, corroded, or stained, making the information on them unclear. This inadvertently increases the difficulty of tracing and drawing. From a drawing perspective, we need to improve the structure and patterns of the missing parts during the tracing process. During this period, there were numerous issues with the drawings in terms of structure, form, pattern expression, and dimensional proportions.

As a multifunctional saddle tool, it integrates various crafts: metalwork, fiber work, weaving, leather tanning, and woodworking. In terms of practical functions: items related to metalwork in saddles cannot fail to mention the Eastern Hu peoples horse bridle (Амгай) discovered in Chifeng, Inner Mongolia. The horse bridle has ring-shaped animal decorations on both sides of the pommel, and when unearthed, its joints were still flexible and could be used. In Xiongnu tombs, saddles are one of the most important burial items. In 1967, 153 Xiongnu tombs excavated at Chaketu, Hunihe,

Noyan Mountain, and Hairihan all contained buried saddles and horse bridles. A saddle found in Tomb No.6 of a nobleman is square, similar to modern saddles used in northern regions. "In Yikzhao League Hangjin Banner, Zhungeer Banner, Bayanzhur League Wulate Zhonghou United Banner in Inner Mongolia, horse bridles (Амгай), horse face decorations (Моринынүүрнийчимэглэл), and horse bits (Зуужээ) have all been unearthed. These findings indicate the significant role horses played in the production and life of the Xiongnu people." During the Xiongnu period, "in 200 BC, Modu Chanyu surrounded Liu Bang at Pingcheng with 400,000 cavalry (present-day eastern Datong, Shanxi), he organized his troops by color: the West was all (white horses), the East was all (blue dragon horses), and the North was all black." Liu (black horse), the south is full of (red-yellow horses "). From the mentioned Xianbei peoples" gilded perforated saddle, "we can see that after the Donghu and Xiongnu, the craftsmanship of horse saddles had greatly developed. During the Liao Dynasty, horse saddles reached their peak. Khitan saddles were the best in the world, with a long history of saddle-making techniques and diverse forms. The production processes included casting, hammering, engraving, and gilding. Materials were mainly gold, silver, and copper, with

exquisite craftsmanship and ingenious design. In 1988, many Mongol-Yuan gold artifacts were discovered in Xianghuang Banner, Inner Mongolia, among which the "lying deer patterned gold saddle" was particularly prominent. The gold saddle featured exquisite decorative patterns and superb craftsmanship. This artifact represents the highest level of nomadic ethnic art and craftsmanship during the Mongol-Yuan period. [3] [4]

2. Design Wisdom and Process Materials (Дизайны чадвар, Оюун билэг, Технологи, Материал)

Nomadic peoples have always cherished horses as if they were their own children. The decoration of saddles was a massive investment, featuring copper casting, silverwork, saddle flowers, and rivets. Deer antlers and horse teeth were inlaid on the saddles, and gold and silver engraving and gilding were used to decorate the saddlery, which was undoubtedly the most luxurious method. Because of their love for horses, songs and eulogies often praise fine steeds, with vivid and realistic depictions of horses in narrative forms.



Fig 4. Wooden saddle structure and shape (provided by Junxi)

The carpenter (Модныдархан) creates a well-fitted and aesthetically pleasing saddle through his skilled craftsmanship. The key to a well-fitted saddle lies in the saddle plates (Эмээлийн хавтас) on both sides. "The wings of the saddle stand upright and outward, open at the back and curve inward. This point is crucial as it directly affects the coordination between the saddle and the horse." (Fig. 4) 1. Based on the study of the horses skeletal structure, the angle between the wing and the saddle bridge is determined by observing the width of the front saddle bridge from the front, which is approximately 8 cm based on the width of the highest point of the horses scapula. A horse has 18 pairs of ribs, with the scapula and the sides of the spine being rib bones. The arrangement of these ribs is narrower at the front and wider at the back, longer at the front and shorter at the back, with the front end connecting to the sternum. Therefore, the width of the rear saddle bridge is about 11 cm. Since the bones are enclosed by flesh, the angle between the front saddle bridge (Урьдбүгүргэ) and the wing is within 90 to 100 degrees. Because there are stirrups (Гөлөм) and gaiters (Тохом) under the wings (Эмээлийн хавтас) of the saddle (Эмээл), they have a certain thickness, providing some cushioning during riding, reducing pressure on the horses back while offering protection. 2. The function of the arched saddle bridge arch reduces the weight of the saddle, distributing the riders weight across the saddle plates, thus forming stability The triangular design avoids pressure on the horses spine and prevents injury.

From structure to material selection, the saddle is made from two wooden boards and two tree branches. The advantage of birch branches is their sturdiness; compared to pine and willow, birch grows more slowly but has stronger vitality. Wood has growth patterns, and based on how fast it grows, its density, fiber length, and resin content vary. Birch trees can be found everywhere in northern grasslands, deserts, and forests. The choice of materials is based on local conditions and an understanding of the properties of birch wood. Selecting the right material for the saddle is also a crucial part of its design. This teaching experience reminds me of the principles of education: "education without discrimination, teaching according to individual aptitude, integrating learning with fun, mutual growth between teaching and learning, applying knowledge practically, practicing what you learn, progressing step by step, and perseverance." [5]

The appearance and evolution of stirrups (Fig. 3) can be traced from materials: leather rope, wood, bone, bronze, steel, and brass. In terms of craftsmanship and design, typical stirrup shapes from the Bronze Age include rib-shaped stirrups (Хавирганыдөрөө). During the Iron Age, stirrups came in various forms such as dragon-head shaped, reclining lion-shaped, gold-inlaid stirrups, official hat-shaped, and cloisonne stirrups. By the Yuan, Ming, and Qing dynasties, both the design and craftsmanship reached their peak. This standard has been maintained to this day, proving that over thousands of years of riding, the shape, technique, and

function of stirrups have become increasingly sophisticated. In practical terms, innovations in stirrups enhance the riding experience by providing a foothold and balance, allowing for better control while on horseback, thus improving combat effectiveness and freeing up hands. To meet needs, leather ropes connect two stirrups, maintaining a fixed distance between them to prevent swinging during rapid rides or runs, forming an integrated unit. The stability of the stirrup position is fundamental to safety. The upper part of the stirrup is secured to the saddle plate with suspension straps, creating a stable triangular structure with the saddle and the left and

right stirrups, distributing weight evenly across the two sides. With a foothold, riders can ride without sitting on the saddle, allowing the buttocks to be free from the saddle, knees bent, and body forward. The weight is transferred to the stirrup, allowing for a riding posture that reduces the burden on the horses back and prevents discomfort caused by jolts. Depending on one's physical condition, you can switch between sitting, standing, or half-squatting at any time, which helps alleviate fatigue. The design of the stirrup and its installation position can be adjusted according to personal needs, making it easy to switch.



Fig 5. The "Pied Time Axis" team was drawn by students

3. Saddle Gear (Эмээлийн тоног төхөөрөмж)

1. The front and rear saddle bridges (Урьд х оидбүү рэг), front and rear saddle strips (Эмээл хяр), saddle plates (Эмээлийн хавтас), saddle girths (Гөлөм), saddle pads (Тохом), stirrups (Дөрөө), and suspension leather straps (Дөрө гэн шуур) serve multiple functions. While the saddle strips enhance aesthetic appeal, they also reinforce the saddle bridges and plates. Saddle pads are made from rough woolen hair of sheep or goats, which provides good breathability and elasticity. Both cowhide and pigskin can be used to make saddle girths, but pigskin girths are more expensive due to their rarity and value, as there are no pig farms on the northern grasslands, and wild boars inhabit the forested areas, making hunting difficult. Cowhide is widely available, and the material used for saddle girths is one of its distinctive features. Another feature is the intricate hand-sewn ethnic patterns on the girths. Besides the material, the quality of craftsmanship significantly influences the price of the saddle girth. The structure of the saddle girth consists of two rectangular leather pieces, with one side made by overlapping and sewing more than two leather pieces, making it very sturdy and durable. The dimensions of the saddle girth are approximately 45cm wide and 70cm long. According to the size of the saddle, the width of the girth is determined, so the dimensions are relative and should be handled with flexibility. The top of the girth aligns directly below the saddle bridge hole, allowing it to be fixed at both ends while leaving an opening in the middle for ventilation. Inside the girth, there are belly straps, and on the outside, there are stirrups and suspension leather strips. The girth effectively isolates ropes, sweat from the horse, stirrups, and legs, enhancing comfort during riding.

2. Saddle pads (Тэвш), saddle flowers (даруулга), saddle board embossing (Баавар), front girth (Хөмөлдөргө), rear girth (Хударга), belly band (Олом), pull belly band (Жирэм), leather strap (Ганзара). Among the above saddlery items, the front girth is Y-shaped, with both ends of Хөмөлдөргө wrapping around the horses neck and securing to the front of the left and right saddle boards. The lower end passes through the chest and is fixed between the two front legs on the front belly band. The Хөмөлдөргө should not be too tight when

secured. The rear girth is usually X-shaped, with its bottom ends connected by leather straps, allowing it to hang down to the horses tailbone. The top ends are positioned on either side of the saddle boards end, fixed together with the saddle board embossing. The primary function of the front and rear girths is to prevent the saddle from sliding forward or backward, especially during mountain rides when climbing and descending slopes, enhancing riding safety. Both the belly band and pull belly band consist of two pieces, each about 150cm long, both fixed to the right saddle board. The material for the belly band is made from trimmed horsehair, which has advantages such as resistance to weathering, good stretchability, non-dyed, non-absorbent, breathable, and thin, soft, and highly sensitive, making it suitable for animals. The horses own hair, woven into the belly band for use, reduces discomfort on the horses body and enhances its comfort, thereby improving safety during riding. The two belly bands of the saddle are usually tighter at the front and looser at the back. The length of the belly band is about 60 cm, made from cowhide hand-tanned by herders, known for its durability. The stirrups should be slightly higher than the lower part of the saddle to provide better protection between the horses body and the stirrups, which helps isolate the horse. The saddle, stirrups, front girth, rear girth, and belly bands form multiple intersections, enhancing riding safety. The design structure conforms to ergonomic principles, and the materials follow natural development laws. The diversity in manufacturing techniques offers broad research value from anthropological, sociological, and aesthetic perspectives.

Focusing on the traditional Mongolian silver ornament craft course, practical teaching is conducted for students from the 17th, 18th, 19th, 20th, and 21st cohorts using group learning methods. According to the practical approaches required by the 2016 and 2019 editions of the curriculum guidelines, starting from the 2019 edition, students from the 19th, 20th, and 21st cohorts are purposefully grouped. Problem-oriented, they aim to complete the assigned content within a set time frame. This shifts their learning from passive to active, focusing on problem-solving and finding answers through proactive and effective self-study. They learn about the development, historical inheritance, and evolution of saddles from historical documents, as well as the rich and diverse production techniques, various types of saddle

designs, colorful and expensive materials, and their development over different historical periods. Compared to the practical courses for the 17th and 18th cohorts, although group learning is also used, there is a lack of student participation, initiative in self-study, and execution capability. Despite being grouped, after entering the practical operation phase, students complete the design drawings of saddles based on personal preferences, which are excellent, but they lack knowledge about the historical development, formation, and origins of saddle structures and designs. According to the course requirements, during the practical learning phase The

method of copying from ancient masters is an approach we advocate for learning from our predecessors. The advantages of this method are evident in the course assignments of grades 19,20, and 21. Students performance in the traditional Mongolian silver ornament craft course is evaluated based on various factors, including design drawings, presentation of assignment results, completion of assignments, display of production techniques, self-reflection through class discussions, regular student behavior, and attendance. (Table 1), (Table 2), (Figure 6)

Table 1. Statistics of D Mongolian Traditional Silver Ornament Craft Course Grades by Grade $\bar{x} \pm s, \text{ОнОО}$

он	Оноо
2017	78.57 $\pm$ 8.98
2018	79.32 $\pm$ 8.71
2019	84.46 $\pm$ 9.32 **#
2020	79.18 $\pm$ 9.75
2021	83.96 $\pm$ 7.79 **#

Note: Compared with the class of 2017** $P < 0.01$; compared with the 2018 cohort # $P < 0.05$

Table 2. Grade D Traditional Mongolian Silver Ornament Craft Course Score Breakdown Statistics Table (percentage%)

Score (Оноо)	2017 он	2018 он	2019 он	2020 он	2021 он
<60	0.00	0.00	0.00	0.00	0.00
60-69	23.40	17.86	8.33	17.86	3.85
70-79	19.15	32.14	12.50	21.43	19.23
80-89	44.68	32.14	41.67	42.85	50.00
≥ 90	12.77	17.86	37.50	17.86	26.92

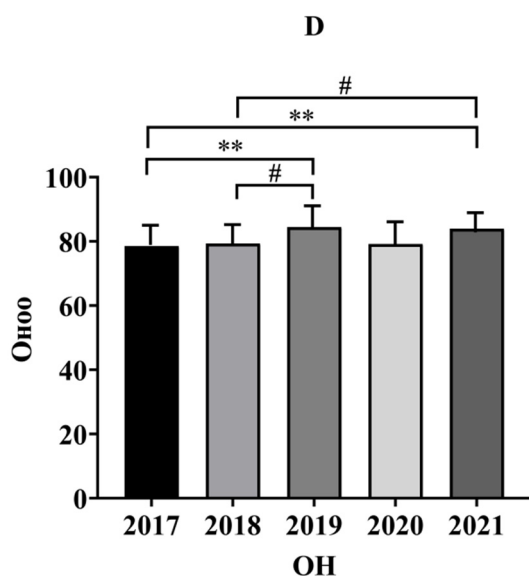


Fig 6. Compares the scores of traditional Mongolian silver ornament craft courses across different grades

Figure 6 compares the scores of traditional Mongolian silver ornament craft courses across different grades. It is evident from the score ranges that compared to Grade 17 and Grade 18, Grades 19,20, and 21 have relatively better performance. The focus is on the practical requirements of professional foundation courses and problem-oriented course objectives. Proactive learning behavior is a prerequisite, a serious attitude is key, and a thirst for knowledge is at the core.

Innovations in science and technology, industry, and tools have made it easier for us to observe objects. While inheriting national culture, we also innovate and develop, focusing on production while paying more attention to human-centric designs that fit the times. Materials are not ranked high or low; based on their characteristics, we find suitable positions for

them and maximize their value. The steel saddles crafted by artisans like Enhe Dawa, known as master of arts and crafts, are very popular in Mongolia and have certain features in metalwork. The prices of these steel saddles, stirrups, bit holders, horse whips, and belt buckles are quite high, with consumers valuing the craftsmanship over the material itself. As the saying goes, "a good horse deserves a fine saddle." When a saddle and horse are well-matched, they can make people feel happy just looking at them. Children often receive a horse as a gift when getting married, symbolizing various values through the saddle. Therefore, the artistic and emotional value far outweighs the material value. The selling price of saddles ranges from 5,000 to over 50,000 RMB, determined not only by the material but also by the craftsmanship. The price range for Mongolian saddles (хоёр сая~хэдэн зуун сая хүртэлбүгд байна) is quite specific. More elaborate saddles often feature various decorations, patterns, carvings, and bone sculptures on both the front and backInlaying, mother-of-pearl inlay, gold and silver engraving, alternating gold and silver, gilding, etc. The saddle is also adorned with many exquisite accessories, such as saddle flowers, saddle panels, studs, stirrups, whips, and bitles. Leather tanning and weaving are both meticulously crafted, with numerous traditional methods for weaving that serve various functions. For example: Олом, Жирэм, Ташуур, Хазаар зэрэгийнсүлжих загвар.

4. Conclusion

In the course of curriculum reform, both teachers and students have increased their workload. Problem-oriented, once questions are posed, the process of finding answers is lengthy. During practical research, students' knowledge base has significantly broadened, and their hand-drawing skills have noticeably improved. Through repeated verification and tracing back to origins, students thinking has become very active, enabling them to think independently and discern right

from wrong among vast amounts of information. The participation level of students has been enhanced, creating a positive classroom atmosphere. When selecting research objects, assess their difficulty and breadth, ensuring they are representative and widely applicable. This benefits the construction of the course. Believe in the students vitality and perseverance. Making saddles is challenging; there is a saying about "ten saddles, nine skewed." To test the fit between the saddle and the horses back, place a piece of paper between the saddle plate and the girth, then ride for some time to observe the wear on the paper, which helps determine the angle of the saddle plates. If the paper remains undamaged, it indicates that the saddle plate fits tightly against the horses back, indicating excellent wrapping performance, making this type of saddle top-quality. From the perspective of use and riding, the shape and structure of components such as saddles and stirrups are crucial. Riding is dynamic, so human and horse safety come first. The saddle equipment forms a whole, with every part being essential. Through the foundational courses in arts and crafts, we discovered the development of an artifacts formation during our practical studies. It evolved from small to large, from parts to whole, from material application to design skills, discovery, and innovation. This

process not only fills us with admiration for the working people but also instills respect for nature and the wisdom of survival under nomadic ecology. We have traced back to the roots of cultural confidence in Chinese civilization, truly appreciating the importance of national culture. This experience inspires us to become inheritors and practitioners of our ethnic culture.

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