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Teaching Practice to Enhance Safety Awareness of Students in Welding Processing Professional Training

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Abstract: As an important part of cultivating students' practical skills, the safety of welding processing professional training cannot be ignored. Students' safety awareness is directly related to their training effectiveness and personal safety in complex environments such as high temperatures, high pressure, and harmful gasses. Therefore, enhancing students' safety awareness in welding processing professional training is not only a guarantee of teaching quality but also a responsibility for students' life safety. This article will explore effective teaching strategies and practical methods based on this. By strengthening safety education, simulating real-scene drills, and building a safety culture, we can comprehensively enhance students' safety awareness and self-protection abilities, escorting their professional growth.

Keywords: Welding processing major; Practical training; Safety awareness

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1. Introduction

Welding processing professional training is a deep integration of technology and practice, and it is also a critical stage for cultivating safety awareness. While mastering welding skills, students need to establish a solid safety concept to cope with various potential risks in practical training. This not only concerns the personal safety of students but also directly affects the quality and effectiveness of practical teaching. Therefore, how to effectively enhance students' safety awareness in the teaching process has become an important issue we must face. Through innovative teaching methods, strengthening safety education, simulating actual combat drills, and other measures, we are committed to creating a safe and efficient learning environment for students, helping them grow into excellent welding talents with both technical strength and safety literacy.

2. Safety teaching objectives of welding processing professional training

(1) Comprehensive understanding of safety norms and requirements for welding processing training: As a high-risk technical practice activity, welding processing training requires students to deeply understand and strictly follow safety norms and requirements. These objectives demand that students not only master basic welding safety knowledge, such as equipment operation procedures, work environment standards, and chemical safety but also be able to internalize this knowledge and externalize it in their actions. To achieve this, teaching should emphasize the combination of theory and practice through case analysis, on-site teaching, interactive discussion, and other methods. This will enable students to deeply understand the importance of safety norms and flexibly apply them in practical operations to ensure a safe and orderly training process.

(2) Strengthen personal protection awareness and proficiency in the use of protective equipment: Personal protection awareness is the first line of defense to ensure students' safety during practical training. In welding processing training, students need to constantly pay attention to their safety and fully recognize the key role of personal protective equipment in preventing accidents. Therefore, one of the teaching objectives is to enhance students' protection awareness, enabling them to actively identify potential risk factors and take corresponding protective measures. Simultaneously, students need to proficiently master the use of various protective equipment, such as adjusting welding masks, wearing protective clothing, and using respirators. The mastery of these skills requires not only theoretical explanations in classroom teaching but also repeated practice and consolidation through practical training. This ensures that students can quickly and accurately use protective equipment in emergencies, protecting their safety.

(3) Cultivate the ability to identify safety hazards and respond to emergencies: During welding processing training, safety hazards are ubiquitous, and emergencies occur frequently. Therefore, students must possess keen safety hazard identification skills and effective emergency response capabilities. Achieving this goal requires teachers to focus on cultivating students' observation and judgment skills in the teaching process. This enables them to accurately identify safety hazards in the training environment, such as equipment failures, improper fire source management, and chemical leaks. Concurrently, teachers should impart basic knowledge and skills for responding to emergencies, including fire escapes, first aid for electric shocks, and chemical spill handling. Through simulated drills and other methods, students can experience and practice these skills firsthand, enhancing their adaptability and psychological resilience in emergencies.

(4) Shape good safety operation habits to reduce training safety risks: Good safety operation habits are crucial for preventing safety accidents. In welding processing training, students must always follow safety operating procedures and maintain utmost vigilance. Therefore, one of the teaching objectives is to help students develop positive safety operation habits, such as regularly inspecting equipment, standardizing tool usage, and maintaining a clean and orderly work environment. The formation of these habits requires continuous emphasis and supervision from teachers in daily teaching. Through demonstration teaching, on-site guidance, supervision, and inspection, teachers can guide students to gradually establish correct safety operation awareness and behavior patterns. Additionally, teachers should encourage students to learn from and supervise each other, jointly creating a safe, orderly, and efficient training environment to reduce safety risks during the training process.

3. Teaching practices to enhance safety awareness of students in welding processing professional training

3.1. Deep practice of personal protective equipment teaching

3.1.1. Deep analysis of the functions and uses of personal protective equipment

Firstly, teaching should focus on the specific functions and uses of various personal protective equipment. The welding helmet, as a key piece of equipment to resist sparks, harmful light, and ultraviolet (UV) rays during the welding process, requires a detailed explanation of its light transmittance, heat resistance, and impact resistance. Protective clothing, like a second skin for students, features flame retardant, heat insulation, and wear resistance properties, which are crucial for protecting students from high temperatures, sparks, and chemical substances. As for gloves, an important barrier for hand protection, their anti-slip, heat insulation, and wear resistance properties need to be selected based on the specific needs of welding operations. During the explanation process, teachers can use physical demonstrations, videos, or virtual simulation technology to give students an intuitive understanding of how these equipment are applied in practical work. At the same time, by combining real welding accident cases, teachers can conduct an in-depth analysis of the serious consequences caused by not wearing or improperly using protective equipment, thereby strengthening students' safety awareness.

3.1.2. Practical operation

Learning theoretical knowledge is fundamental, but true mastery requires a practical operation to test it. Organizing students for practical training is an indispensable part of personal protective equipment teaching. Teachers can design a series of targeted training programs, such as adjusting and wearing welding helmets, putting on and adjusting protective clothing, and selecting and wearing gloves. During the training process, teachers should provide patient guidance to ensure that each student can operate according to the correct steps and methods. To enhance the interactivity and fun of teaching, teachers can adopt forms such as group competitions and role-playing, allowing students to master the use of personal protective equipment in a relaxed and pleasant atmosphere. In parallel, teachers should also focus on observing students' operation processes, discovering and correcting wrong actions promptly, and ensuring that each student can meet the teaching requirements.

3.1.3. Continuous guidance and feedback

The teaching of personal protective equipment is not a one-time task but requires continuous reinforcement and improvement in daily practical training. Therefore, teachers should continuously monitor students' usage, providing necessary guidance and assistance. During practical training, teachers should regularly check whether students' personal protective equipment is worn correctly and intact, and remind students to pay attention to equipment maintenance and care. Additionally, teachers should establish an effective feedback mechanism to encourage students to raise questions and suggestions. By collecting student feedback, teachers can adjust teaching strategies and methods on time to meet students' learning needs. In unison, teachers should regularly organize students to review and summarize common problems and solutions with the use of personal protective equipment, helping students consolidate learning outcomes and enhance self-protection abilities.

3.2. Comprehensive practice of safety education for training sites and equipment

3.2.1. Safety inspection of training sites

Conducting a comprehensive safety inspection of the training site before each practical training session is an essential step. This includes checking all facilities and equipment on the site individually to ensure they are in good working condition, without damage, aging, or safety hazards. Special attention should be paid to checking whether the fire-fighting facilities are complete and effective, whether the emergency evacuation passageways are unobstructed, and whether the electrical wiring meets safety standards. Furthermore, the ventilation system of the training site should be inspected to ensure it can effectively remove harmful gasses and dust generated during the welding process, maintaining air quality. During the inspection process, the principle of "meticulous attention to detail" should be adhered to, leaving no detail unchecked. Any identified issues or hidden dangers should be rectified immediately to ensure the safety of the training site. Simultaneously, a sound safety inspection system should be established to normalize and institutionalize safety inspection work, forming a long-term mechanism.

3.2.2. Inspection and maintenance of welding equipment

Welding equipment is an indispensable tool in the practical training process, and its safety and stability are directly related to the training effectiveness and students' safety. Therefore, teaching students how to inspect and maintain welding equipment is one of the important aspects of safety education in practical training. Firstly, it is necessary to explain the structure, performance, and usage methods of welding equipment to students in detail, helping them establish a comprehensive understanding of the equipment. Based on this, the focus should be on imparting equipment inspection and maintenance skills. This includes teaching students how to check the integrity of power cables, the tightness of connections, equipment grounding protection, and other critical areas. It also involves teaching them how to identify potential abnormalities during equipment operation, such as unusual noises, overheating, and vibrations. Moreover, students should be instructed on routine equipment care and maintenance, such as cleaning equipment surfaces, replacing wearable parts, and lubricating transmission components. At the same time, it is important to emphasize that students should strictly follow operating procedures when using equipment and not arbitrarily change equipment parameters or perform unauthorized operations. While using the equipment, students should constantly monitor its operating status and immediately stop and report any abnormalities to the teacher. After use, equipment should be shut down and cleaned according to prescribed procedures, ensuring it is in a good standby state. By imparting welding equipment inspection and maintenance skills, not only can safety accidents caused by equipment failures be prevented, but students' sense of responsibility and self-protection abilities can also be cultivated. They will learn how to take responsibility for their actions and how to protect their own and their classmates' safety. This sense of responsibility and self-protection ability will accompany them throughout their professional careers, becoming their valuable assets.

3.3. Emergency handling and rescue skills training

3.3.1. Laying the foundation with basic skills

Firstly, the teaching of emergency handling skills should cover core content such as initial fire suppression and first aid for electric shocks. In terms of initial fire suppression, students need to master the use of different types of fire extinguishers, understand the basic laws of fire spread, and learn to assess the fire situation and take corresponding suppression measures. Through a combination of theoretical explanations

and practical drills, students can experience the fire suppression process in simulated fire scenarios and master correct fire-fighting techniques. First aid for electric shocks is another crucial skill. Students need to understand the dangers of electric shocks and learn basic assessment methods and emergency steps after an electric shock. By simulating electric shock situations, students can practice emergency skills such as cardiopulmonary resuscitation (CPR) in a safe environment and master correct emergency procedures and techniques. Simultaneously, the importance of safe electrical usage should be emphasized to raise students' self-protection awareness.

3.3.2. Practical emergency drills

After theoretical learning, emergency drills become a key link to test and improve students' emergency response capabilities. The drills should be closely integrated with the actual situation of the training site, simulating real accident scenarios such as fires caused by short circuits in welding equipment or operators accidentally suffering electric shocks. Through preset scenarios and simulations of emergencies, students can quickly activate emergency plans and implement rescue operations in a tense atmosphere. During the drills, teachers should play the role of guides and evaluators, observing students' emergency response speed, decision-making ability, and team collaboration skills. Concurrently, reasonable evaluation criteria should be set to objectively evaluate students' performance, point out existing problems, and provide suggestions for improvement. After the drills, students should be organized to summarize and reflect, sharing experiences and lessons learned to further consolidate and enhance their emergency handling and rescue capabilities.

4. Conclusion

Enhancing the safety awareness of students undergoing welding training is a continuous and far-reaching task. Through systematic teaching practices, not only do students master professional welding skills, but more importantly, they learn how to maintain vigilance in complex and changing environments, effectively preventing and responding to potential safety risks. This is not only responsible for students' personal growth but also an important contribution to future industrial safety. Looking ahead, teachers need to continue exploring more efficient and practical teaching methods, constantly optimizing the safety awareness training system, laying a solid foundation for students' comprehensive development, and delivering more outstanding welding talents with both technical strength and safety literacy to society.

Disclosure statement

The author declares no conflict of interest.

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