


# Chapter 11

## Breaking Ground and Language Barriers: The Power of Universal Design in Construction Training and Education

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### **ABSTRACT**

*This chapter addresses the pressing need to incorporate universal design for learning (UDL) principles into online construction management education, focusing on the challenges faced by non-native speakers. Against a backdrop of heightened fatality and injury rates among Hispanic construction workers in the U.S., the chapter employs a mixed-methods approach, combining qualitative interviews and case studies with quantitative analysis of course metrics. Anticipated findings include identifying common challenges such as language barriers emphasizing the transformative role of UDL in fostering inclusive learning environments. Real-world examples and case studies will showcase practical UDL techniques, offering insights into effective strategies tailored for construction management education. The chapter concludes with a call for educators and institutions to embrace UDL principles, promoting a more diverse, equitable, effective, and safe educational environment within the construction industry.*

DOI: 10.4018/979-8-3693-1269-8.ch011

## **INTRODUCTION**

Much of the focus on occupational health and safety centers on post-accident measures to prevent future incidents. Today, accident investigations rarely recognize the challenges of language barriers as a fundamental root cause of incidents (Lindhout et al., 2019). Language barriers in construction must be addressed on both ends of the spectrum when preventing future accidents from occurring. This chapter focuses on applying universal design for learning (UDL) principles to online construction management educators of non-native speakers. It highlights the challenges learners face and provides a practical strategy for creating inclusive online learning environments that could be enhanced to foster new understanding and engagement strategies for non-native-speaking construction workers.

According to the U.S. Bureau of Labor Statistics (2020), construction industry workers account for 30% of the workforce. About half of the construction laborers are Hispanic, accounting for 46.7%, and 52.5% are painters and paper hangers. Hispanics represent 14.4% of construction managers, while non-Hispanic Whites, who reflect 60.9% of the construction workforce, represent 78.9% of construction managers.

According to the Occupational Safety and Health Act of 1970, workers must receive occupational safety training in a language they understand. This suggests that if a worker were hired, the company would provide the training in the worker's primary language. Many small construction companies need more resources to meet this requirement. Additionally, numerous minor businesses must gain the technical knowledge to recognize that this is a legal requirement. For this reason, many companies are looking for qualified workers with the necessary hard skills at hiring. Hard skills are a person's skill set and ability to perform a specific task or activity (Hendarman & Tjakraatmadja, 2012).

Occupational safety training completion is known as administrative control. In addition, organizations often use training completion as a leading indicator to prevent specific types of occupational injuries. The use of UDL is not usually a focus for practitioners. However, research has shown that mnemonic tools are an excellent way to train employees and ensure they retain the essential skills needed to prevent injuries.

The use of mnemonic tools has long been documented in multiple educational endeavors. This is evidenced by Merry (2021) in response to COVID-19 online instructional environments using a mnemonic device called Patterns. The utilization of such tools to reach students of diverse backgrounds was also seen in multiple research groups such as those found in Hardison and Gray (2021) and Albert et al (2014) (add citations). Hardison and Gray (2021) examined the use of the hazard energy wheel to observe the retention of firefighter hazard recognition three months after the completion of training. Their study found that training via this method

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