

# Training Beginning Welders Using Virtual Reality Simulations

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## Introduction

Incorporating VR technology into welding training is safe, cost and time efficient, and educationally effective.

Previous research has shown that integrated VR welding training can result in:

- ❖ Gains in welder dexterity
- ❖ Increased cognitive development
- ❖ Faster weld skill development

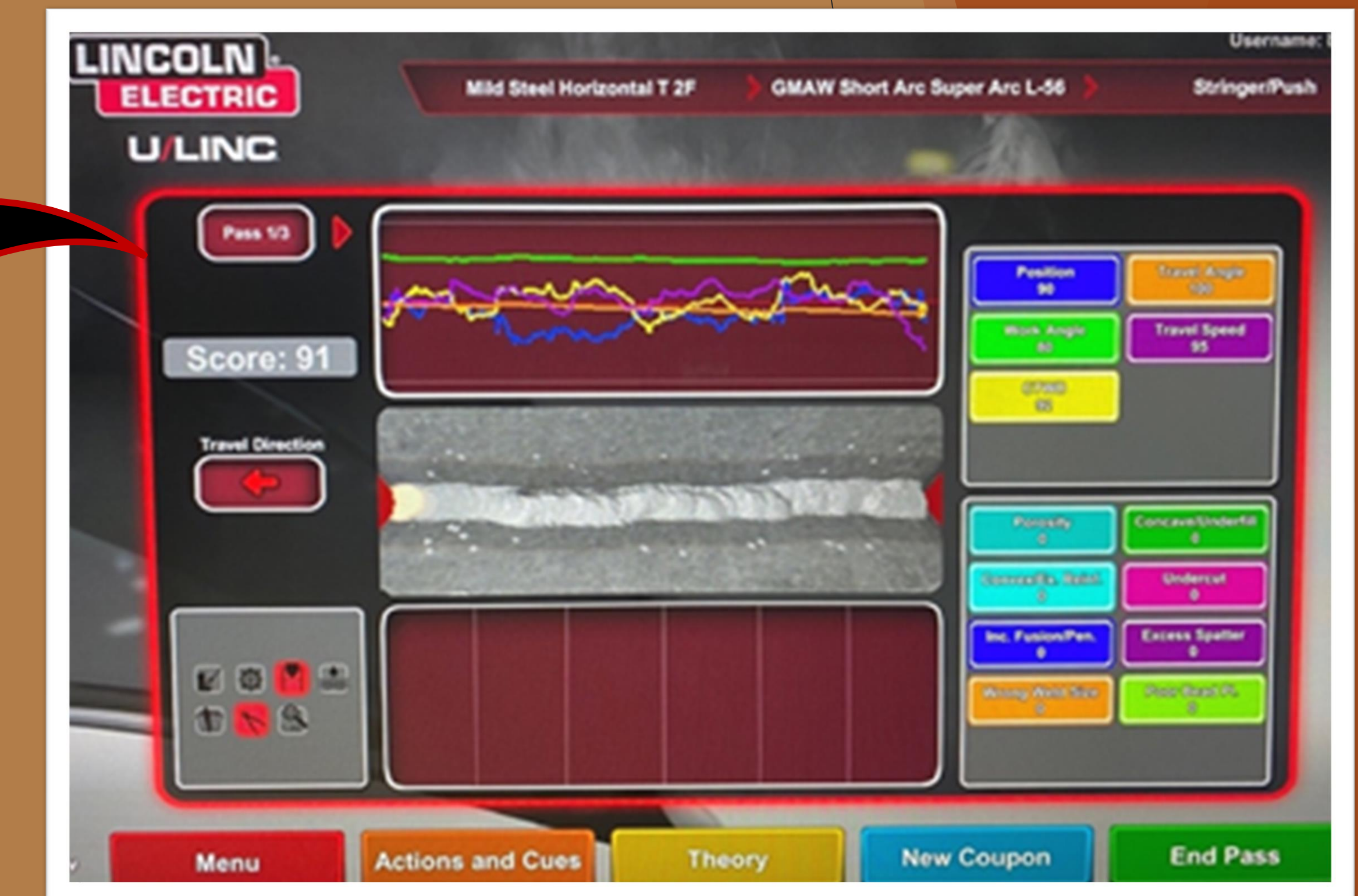
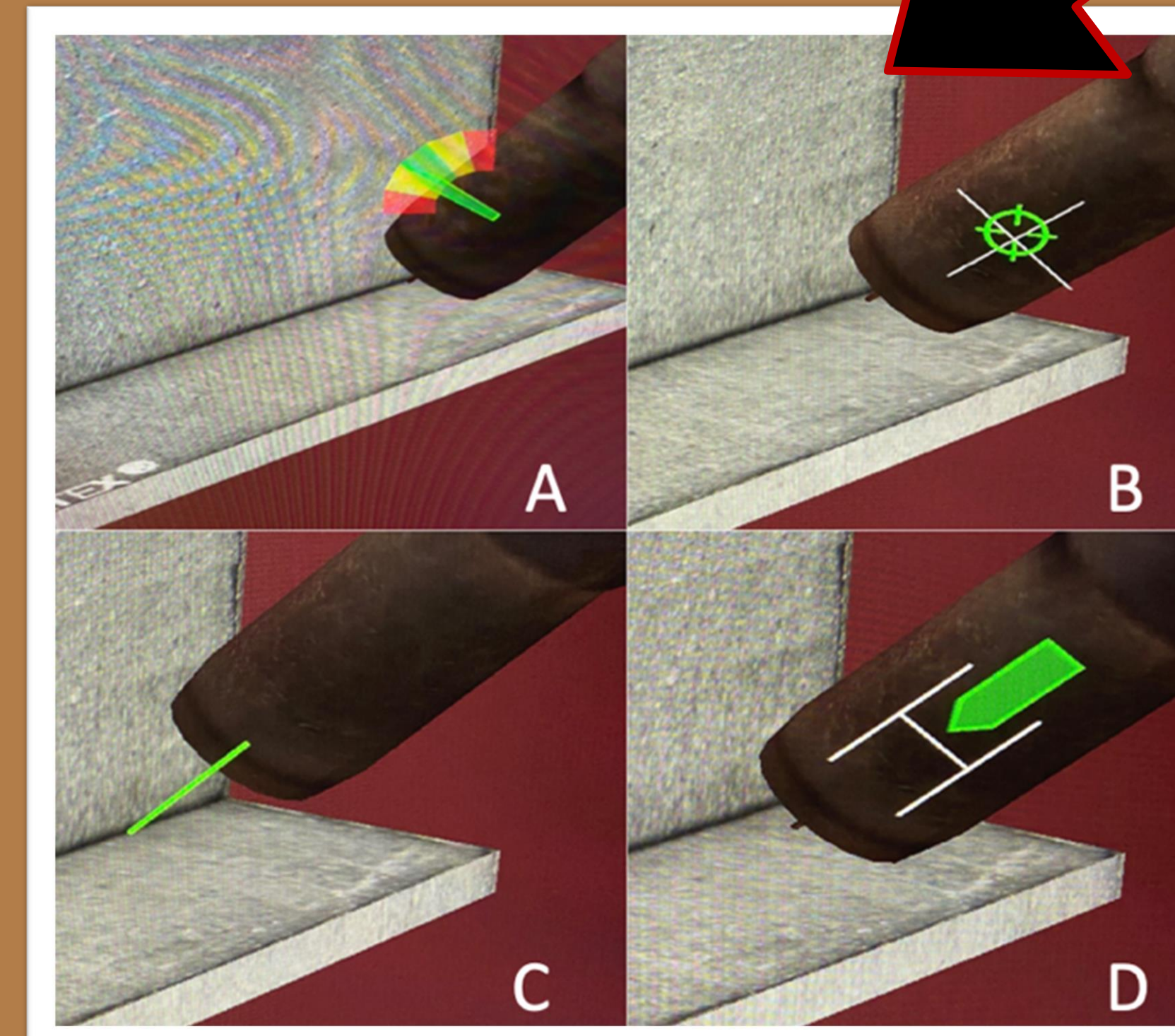
## Methods

44 undergraduate students enrolled in the Intro to Agricultural Engineering course underwent the following:

1. Demographic survey completion
2. Randomized sequence group assignment
3. Three weeks performing VR, AR, and live weld training protocol
4. Live weld test completion during week four

## Conclusion:

1. Mean scores of 80+ following an hour and a half VRTEX 360 training session indicates that participants received meaningful learning
2. A mean score of 80.66 for live welds during the final week of the study indicates participants showed complex understanding and weld skill retention for a 2F fillet weld



## Conceptual Framework

Ausubel's assimilation theory explains that meaningful learning guides learners to understand complex systems and develop skill retention.

## Purpose

This study aligns with the AAAE NRA Research Area Priority 4: Meaningful, Engaged Learning in all Environments by comparing weld scores using the VRTEX 360 welding simulator and traditional live weld GMAW process in alignment

## Results

Weld Scored	Mean	SD	t	p
VR Weld 1	80.11	9.67	-0.28	0.78
VR Weld 2	82.43	7.98	0.88	0.39
VR Weld 3	83.11	10.22	1.03	0.31
Live Weld	80.66	11.12		

## Implications:

- ❖ Parameter grading settings within the VRTEX 360 are aligned to parameter grading used by the CWI
- ❖ Future research should investigate more rigorous parameters within the virtual welding environment
- ❖ Future practice integrating VR should provide adequate time to familiarize learners with VR environment and personalized feedback cues