Analysis of Training Effectiveness for Advanced Warehouse Management Systems

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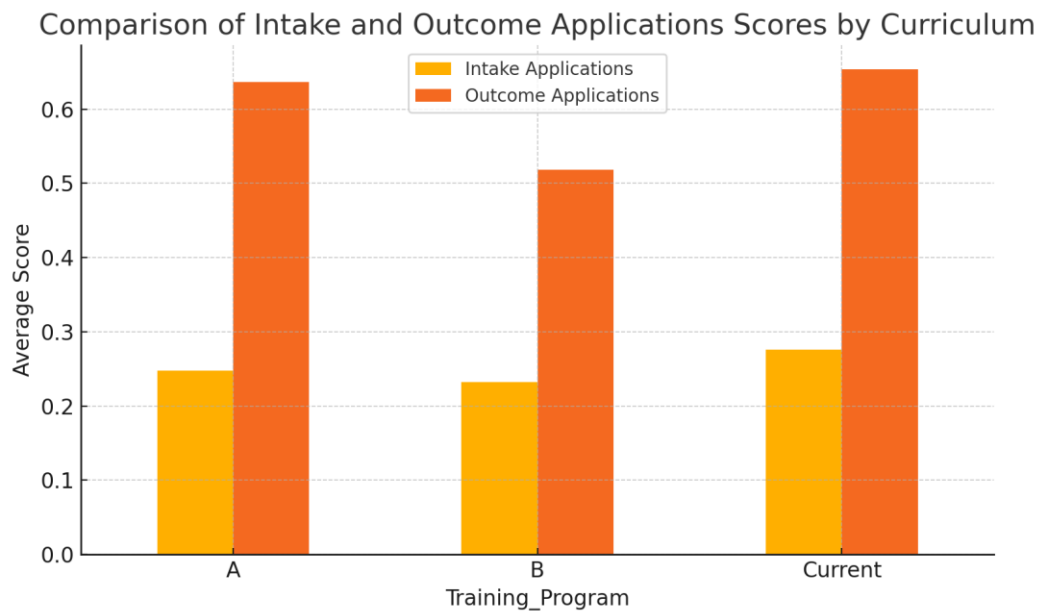
Introduction and Objectives

Evaluating the effectiveness of new training programs (A and B) compared to the current program.

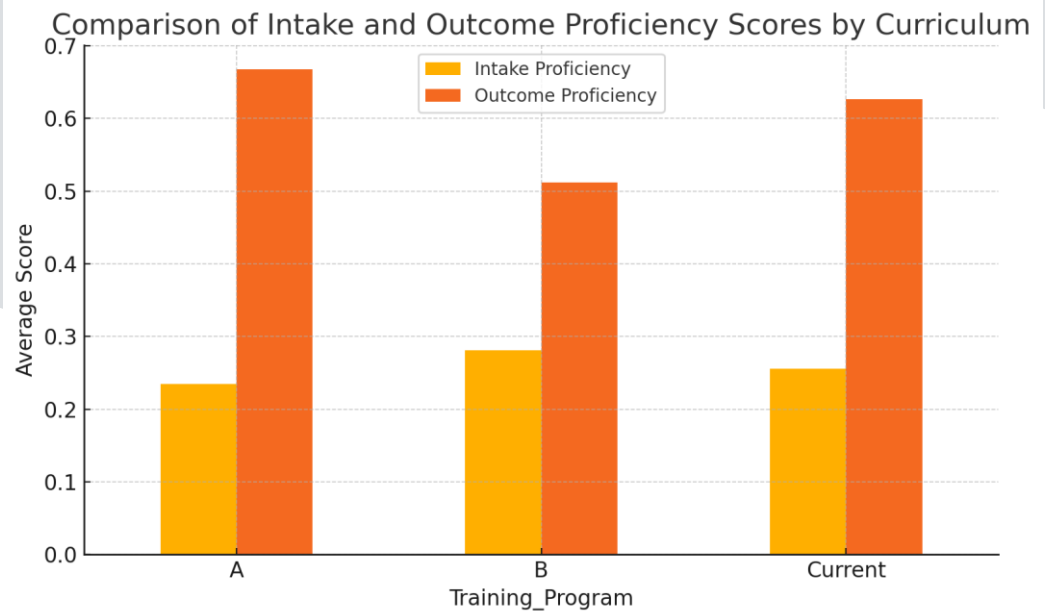
Identifying the best curriculum to improve employee performance.

Discussing the experimental design to ensure validity and reliability.

Proficiency & Applications Scores Comparison by Curriculum

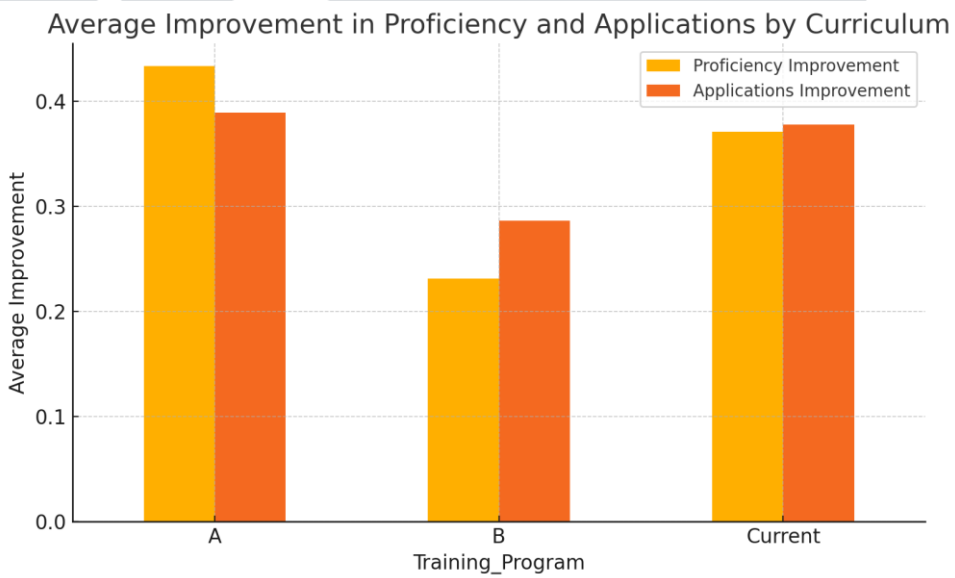


- **Curriculum A** is most effective for enhancing conceptual understanding, making it a strong candidate for adoption.
- **Curriculum B's** limited impact suggests it is not a viable alternative.



- While **Curriculum A** excels in proficiency, its applications training module needs refinement to match the Current program's practical effectiveness.
- **Curriculum B's** performance highlights its unsuitability for adoption.

Average Improvement Comparison



Proficiency Improvement: **Curriculum A** achieved the highest average improvement by +**43.3%,** indicating its ability to boost conceptual knowledge.

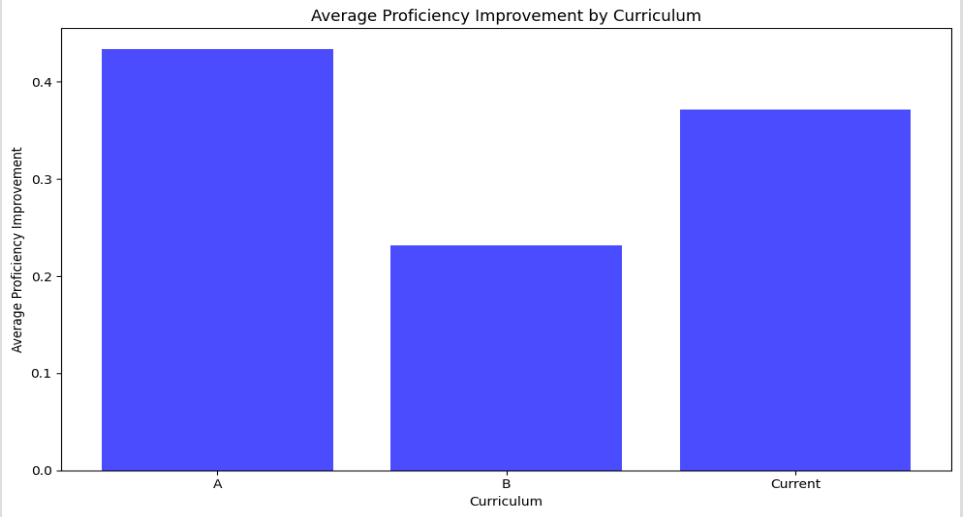
Applications Improvement: The **Current program** maintained a slight edge in applications scores, suggesting its superior focus on practical skills.

Curriculum B had the **lowest** improvement across both metrics, confirming its limited effectiveness.

Proficiency & Applications Scores Comparison by Location

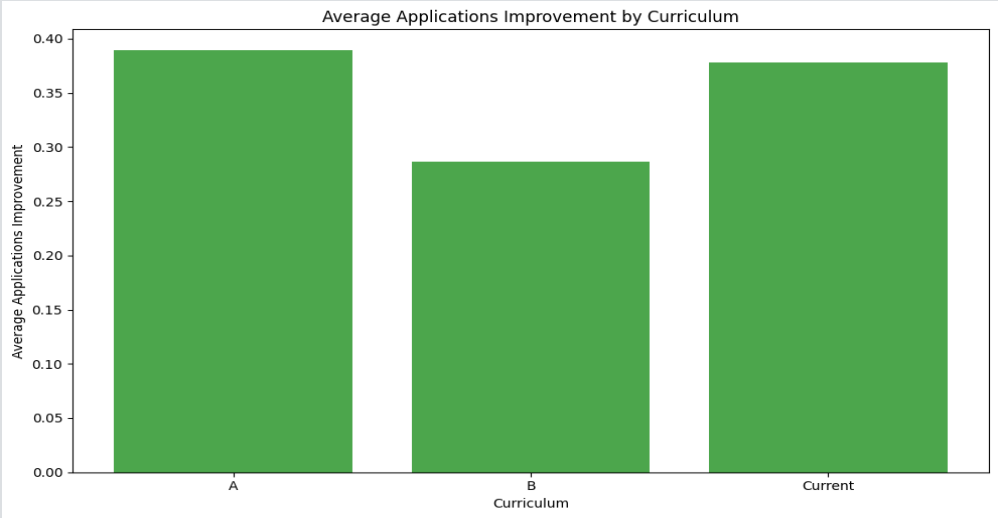
Proficiency Improvement:

- **Curriculum A**: Average improvement of **0.433**.
- **Curriculum B**: Average improvement of **0.231**.
- **Current Curriculum**: Average improvement of **0.371**.



Applications Improvement:

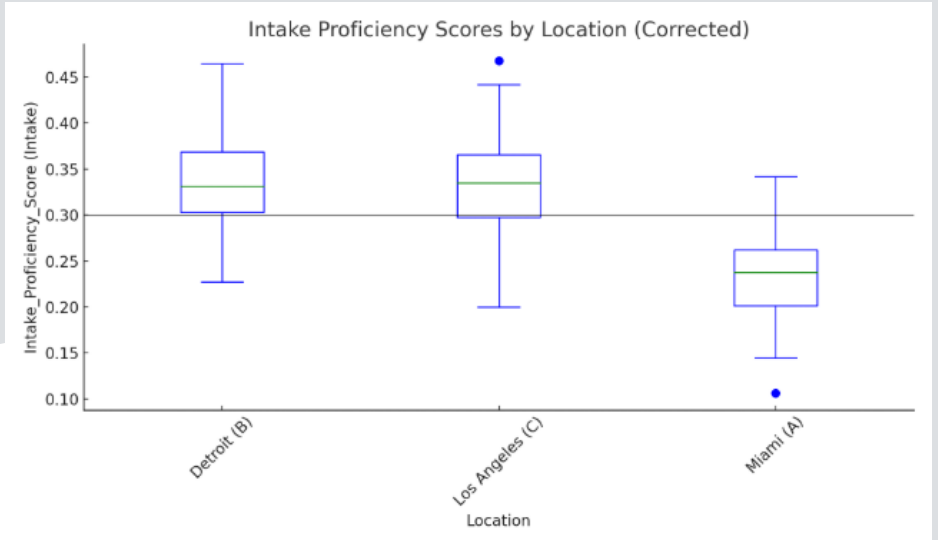
- **Curriculum A**: Average improvement of **0.389**.
- **Curriculum B**: Average improvement of **0.286**.
- **Current Curriculum**: Average improvement of **0.378**.



Distribution of Scores Per Location

Key Observations:

- **Miami (A):**
  - The median proficiency score is the highest among the three.
  - The distribution of scores is less varied than Los Angeles, with a smaller IQR.
  - The range is narrower but overall higher compared to Detroit.
- **Detroit (B):**
  - The median proficiency score is lower compared to other locations.
  - The interquartile range (IQR) is relatively narrow, indicating less variability in scores.
  - The maximum score is slightly above 0.35, while the minimum is close to **0.1**.
- **Los Angeles (Current):**
  - The median score is slightly higher than Detroit but still below Miami.
  - The IQR is the largest among the three locations, indicating more variability in the proficiency levels of employees.
  - There are some higher scores, with the maximum reaching nearly **0.4**.



Distribution of Scores Per Location

- **Miami (A):**

  The highest median score, at approximately **0.7**, and the largest overall range, reaching nearly 0.8.

  The IQR is slightly wider than Los Angeles but narrower than Detroit, suggesting a more consistent improvement across participants.

- **Detroit (B):**

  The median outcome score is the lowest, with a value close to **0.55**.

  The range is relatively narrow, with less variability in scores compared to other locations.

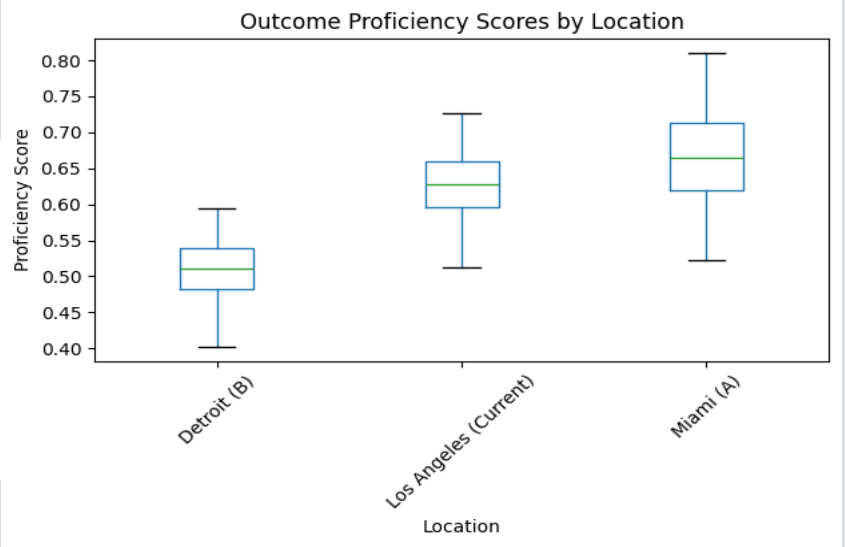
  The maximum score is below **0.65**, indicating limited improvement after training.

- **Los Angeles (Current):**

  The median score is higher than Detroit, at approximately **0.65**.

  The IQR is slightly smaller than in the intake graph, showing moderate variability in performance.

  The range of scores is from around **0.5** to just above **0.7**, indicating a reasonable improvement.



Overall Insights

Pre-Training vs. Post-Training:

Miami (A) consistently outperformed other locations both before and after training, suggesting a combination of stronger initial capabilities and an effective training program.

Detroit (B) consistently lagged behind, indicating a need for intervention to improve training outcomes.

Employees in Miami (A) consistently outperform those in Detroit (B), both at intake and after training.

Training seems to have had the most impact in Miami, while Detroit exhibits minimal gains.

Discussion of Experimental Design

Strengths:	The experiment involved multiple locations, providing geographical diversity.
	The use of both proficiency and application scores offers a balanced measure of training effectiveness.
Potential Weaknesses:	Unequal Sample Sizes: If office sizes vary, performance data could be biased by sample size differences.
	Location-Specific Factors: Office-specific factors (e.g., local management practices or employee demographics) might influence results.
	Duration of Training: A two-month period may not capture long-term impacts of the training.
	Uncontrolled Variables: External factors, such as prior employee experience or differing resources across offices, may confound results.
Recommendations to Strengthen Validity:	Standardized Conditions: Ensure all locations receive identical resources and support during training.
	Longitudinal Study: Extend the study duration to evaluate the long-term effectiveness of training programs.
	Balanced Sampling: Use stratified sampling to ensure uniform representation across offices.

Conclusion & Recommendation

Adopt Curriculum A: Curriculum A exhibits the highest performance improvements across both metrics (proficiency and applications). Implementing this curriculum would likely yield better outcomes for employees.

Reject Curriculum B: Curriculum B does not offer improvements sufficient to justify adoption, as it underperforms compared to both Curriculum A and the Current curriculum.

Curriculum A demonstrates clear advantages and should be adopted after addressing potential experimental design limitations in future iterations. This approach ensures evidence-based decision-making while maintaining reliability and validity.