Bridging the Training Gap:

How Staff Profiles Drive Measurable Outcomes

Hi Rasmus®

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Executive Summary

Effective staff training is critical for achieving optimal client outcomes in applied behavior analysis (ABA). However, numerous barriers hinder the implementation of high-quality training. These barriers include limited time, high staff turnover, variability in supervision, and logistical challenges (Parsons et al., 2012). Inadequate training has been associated with decreased treatment fidelity and poor client outcomes, such as delayed skill acquisition and failure to meet treatment goals (Parsons et al., 2012).

This study hypothesized that implementing a well-designed technology package would improve staff competency and positively impact client outcomes. The technology pack focused on competency-based training and integrated within daily client sessions. A total of 572 participants were examined in a blinded controlled experiment in which anonymized aggregated data was pulled across clinics based on their use of our staff profiles feature. A control group of 286 clients from 10 US-based organizations was compared to a test group of 286 clients from 12 US-based organizations. The test group utilized the staff profile in addition to client profiles, while the control group only utilized client profiles. The groups were compared to analyze the rate of mastered learning targets per session hour.

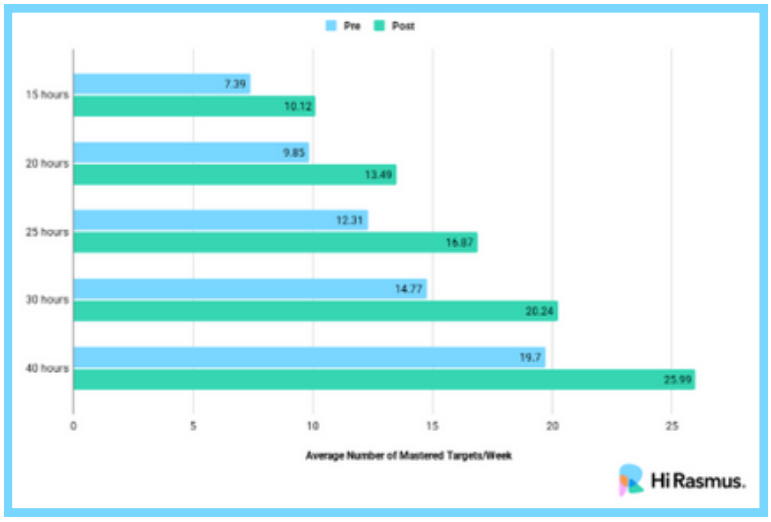
Statistical significance: Three statistical analyses were completed: Wilcoxon Signed Rank, Mann-Whitney U Test, and a Quade's ANCOVA. Across each analysis, the results suggested significant improvements in rate of skill acquisition, indicating that the experimental group outperformed the control group after the staff competency intervention.

Clinical significance: Prior to use of staff training profiles, the clients from the experimental group mastered an average of .49 targets per session hour. After the use of staff profiles for an average of 105 days, the average rate increased to .67 mastered targets per session hour. To gain a sense of clinical significance, Figure 1 demonstrates what the average increase would result in based on various dosage amounts.

Clinical Significance

Prior to use of staff training profiles, the clients from the experimental group mastered an average of .49 targets per session hour. After the use of staff profiles for an average of 105 days, the average rate increased to .67 mastered targets per session hour. To gain a sense of clinical significance, Figure 1 demonstrates what the average increase would result in based on various dosage amounts.

Figure 1. Illustrative Impact of Staff Profile Use on Mastery Rates by Treatment Dosage.



Takeaways:

Across statistical and clinical significance, our experimental group performed better than our control group.

We conducted this study to make data-driven decisions about our staff profile features. Essentially, the results of this study gave us insights into the value of a well-designed staff training technology package.

Introduction

Effective staff training is essential for ensuring high-quality service delivery in applied behavior analysis (ABA). Best practices in ABA staff training emphasize competency-based approaches, including behavior skills training (BST), which integrates instruction, modeling, rehearsal, and feedback to build practical skills (Parsons, Rollyson, & Reid, 2012). Research has consistently demonstrated that training methods combining direct instruction with performance feedback are more effective in producing long-term skill acquisition and generalization than didactic methods alone (Ward-Horner & Sturmey, 2012). Additionally, in-situ training and ongoing supervision have been identified as critical components for promoting treatment fidelity and maintaining staff performance (Blackman, DiGennaro Reed, Erath & Henley, 2022).

Despite these established best practices, there is considerable variability in how staff training is implemented across ABA service providers. Many organizations rely heavily on passive training formats such as didactic training or online modules, which may not produce sufficient skill mastery when used in isolation (Shrestha et al., 2020). Furthermore, while initial training is often prioritized, the ongoing support necessary to maintain and generalize staff competencies—such as coaching, booster sessions, and fidelity checks—is frequently underutilized in practice.
Barriers to implementing evidence-based training approaches include limited time, staffing constraints, and insufficient organizational infrastructure to support ongoing supervision and feedback (Dickson et al., 2021). High staff turnover and variable baseline skill levels further complicate the training process. Technology-based solutions offer a promising avenue for overcoming these challenges by facilitating scalable, data-informed, and interactive training systems. This white paper presents findings from a recent study aimed at improving the quality and efficiency of staff training through an innovative ABA technology platform.

Research Aim: This study hypothesized that implementing a well-designed technology package would positively impact client outcomes.

Variables

Hi Rasmus Staff Profiles: Use of a tech-enabled online package where a supervisor collects data on a staff member's performance.
Staff Competency Session: A session run on the platform that includes data on staff performance. Session duration between 10 minutes and 6 hours. Deleted sessions were excluded from the analysis.
Dependent variable: Learning outcomes defined as the rate of skill acquisition; the rate of mastered targets per session hour.

Pre-test scores and post-test scores were measured by the number of mastered targets per session hour.

Methods

We conducted a **blinded controlled experiment** in which we pulled anonymized aggregated data across clinics based on their use of our staff profiles feature.

We included 572 participants, 286 clients whose staff members use staff profile features and 286 clients whose staff members don't use staff profile features. We measured learner outcomes by looking at the short-term **client outcomes indicator of rate of skill acquisition**, defined by the total number of mastered targets per session hour. We looked at pre/post data. Pre defined as a 30-day period before the use of staff profiles and staff competency programs. Post defined as a 30-day period, on average, 105 days after the start of the designated 30-day period.

Platform and Training Features

Hi Rasmus Data Collection Platform: Staff Profiles

The staff training package was available as an add on in Hi Rasmus. Participants in the study were existing Hi Rasmus users and added staff profiles to their subscription. Participants were able to use the built-in staff features to support their training efforts. Features include:

- Ability to create custom staff programs
- Access to the Hi Rasmus Catalog with over 250 pre-made staff programs
- Ability to collect data on staff performance while concurrently supervising client sessions
- Real time graphical display of staff performance data
- Ability to integrate staff programs and progress graphs into reports (performance reviews)

Results

Mann Whitney U Test

A Mann-Whitney U test was conducted to compare scores between the Training and Control groups at both pre-test and post-test. Pre-test results indicated that there was no significant difference between the Training group (Mdn = 297.46) and the Control group (Mdn = 275.54), U = 37,764.00, Z = -1.588, p = .112, r = .066. Post-test results showed a statistically significant difference between the Training group (Mdn = 317.80) and the Control group (Mdn = 255.20), U = 31,946.00, Z = -4.531, p < .001, r = .189, with the Training group having a higher mean rank (M = 317.80) than the Control group (M = 255.20). Refer to table 2 in appendix for Mann Whitney U Test results.

Results, continued

Quade's ANCOVANon-Parametric Analysis

Non-parametric tests were selected for this study due to the violation of normality assumptions and the presence of ordinal-ranked data. The Mann-Whitney U test was used to compare differences between the Training and Control groups, as it is appropriate for independent samples when the assumption of normality is not met. Additionally, the Wilcoxon Signed-Rank Test was utilized to examine within-group changes from pre-test to post-test, as it is suitable for paired data when assumptions of parametric tests are violated. Quade's ANCOVA was employed to control for pre-test rankings while analyzing post-test differences, providing a rank-based alternative to traditional ANCOVA. These analyses ensure robust and valid conclusions while minimizing the influence of distributional irregularities.

Wilcoxon Signed Rank

A Wilcoxon signed-rank test was conducted to evaluate the effect of the training intervention on participants' scores from pre-test to post-test within the experimental group. The results indicated a statistically significant increase in scores following the training ($p < .001$) suggesting that the intervention had a positive impact on participant performance. The effect size ($r = .21$) indicated a small-to-moderate effect. In the experimental group, 170 participants showed an increase in scores (Mean Rank = 136.55, Sum of Ranks = 23,214.00), 102 participants showed a decrease (Mean Rank = 136.41, Sum of Ranks = 13,914.00), and 14 participants had no change. Refer to table 1 in appendix for Wilcoxon Signed Rank results.

Results, continued

Conversely, a Wilcoxon signed-rank test performed within the control group revealed no statistically significant difference between pre-test and post-test scores (p=.087) suggesting that the control condition did not lead to measurable improvements. The test statistic was 21,538.000, with a standard error of 1334.453, and the total sample size for the control group was 286.

Discussion

Statistical and Clinical Significance

Statistical Significance refers to whether an observed effect in a study is likely due to chance or if it is real, based on a pre-determined threshold (i.e., p-value < 0.05). It does not measure the size or practical impact of the effect—just whether it is unlikely to have occurred randomly. Clinical Significance refers to the practical importance or meaningfulness of a result in real-world applications, particularly in healthcare. A result can be statistically significant but still have little to no real impact on patient outcomes. Both are important!

Statistical significance ensures validity. If a study finds an effect that is statistically significant, we can be reasonably confident that the effect is not due to random chance. Clinical significance ensures relevance.

Even if an effect is statistically significant, it must also be large enough or meaningful enough to make a difference in real-life decisions (e.g., patient care, treatment outcomes). Statistical significance tells us if a result is real (not due to chance). Clinical significance tells us if the result matters (in real-world applications). A good study aims to achieve both—showing an effect that is not only statistically valid but also meaningful in practice.

Clinical Significance and Learner Outcomes

We chose to look at the rate of skill acquisition, simply because this is a variable most commonly used to note meaningful outcomes in our field. Weiss (1999) for example, examined differential rate of skill acquisition as a representation of outcomes for EIBI interventions.

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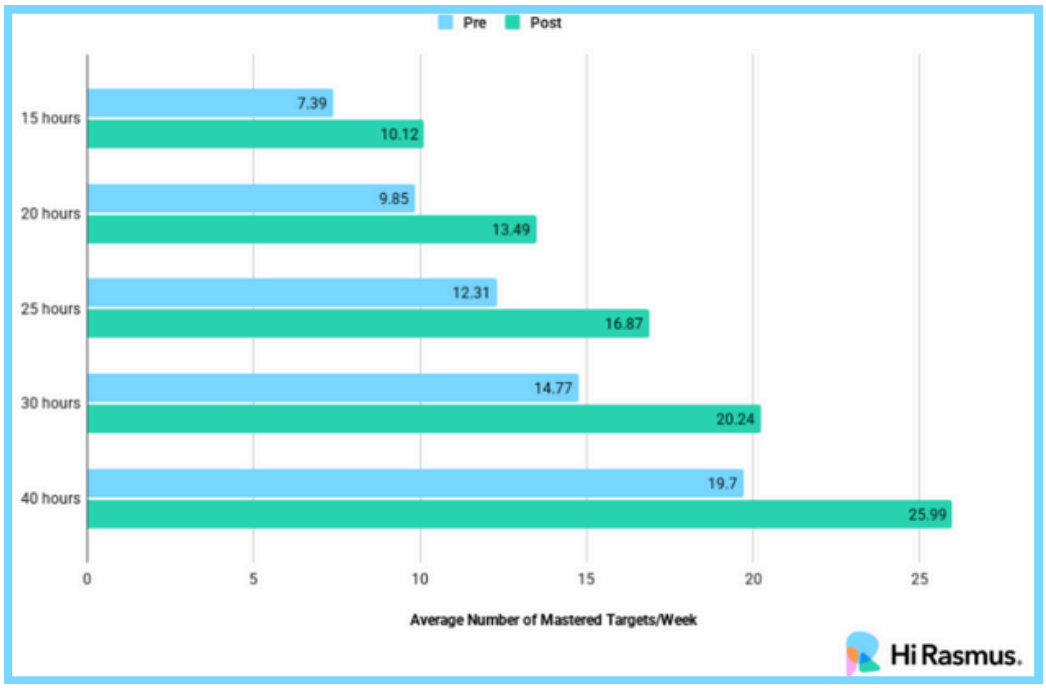
Figure 2. Illustrative Impact of Staff Profile Use on Mastery Rates by Treatment Dosage.



How does the rate of skill acquisition translate to meaningful outcomes? Given the average pre-treatment rate (0.4924): If a client worked 3 session hours per day, 15 session hours per week, and 60 session hours per month, the expectation would be that the client would master approximately 1.5 target per day, 7.4 targets per week, and 29.5 targets per month. Given the average post-treatment rate (0.6747): If a client worked 3 session hours per day, 15 session hours per week, and 60 session hours per month, the expectation would be that the client would master approximately 2 targets per day, 10 targets per week, and 40.5 targets per month.

Outcomes Indicators

Outcome indicators are measurable criteria that define the impact of a healthcare service or intervention on the health status, well-being, or quality of life of clients or patients (CASP, 2022).

Short-term indicators

Long-term indicators

Short term outcomes indicators capture changes that occur within a shorter time frame and often serve as predictors of long-term success. These indicators are particularly valuable in providing timely feedback on whether the intervention is on track to achieve its long-term objectives. Long-term outcome indicators focus on the sustained effects of healthcare interventions, often requiring years to become evident. These indicators are essential for assessing the ultimate success and durability of interventions in improving health outcomes.

By integrating both short-term and long-term outcome indicators, organizations can gain a comprehensive understanding of the immediate and enduring effects of their services. This approach allows for the early identification of potential issues, the refinement of interventions, and the assurance that services are aligned with long-term health goals (CASP, 2022).

The intersection of learner outcomes and staff training

Structure indicators provide detailed information about the foundational elements of the environment and infrastructure in which services are delivered (CASP, 2022).

The literature suggests inadequate training has been associated with decreased treatment fidelity and poor client outcomes, such as delayed skill acquisition and failure to meet treatment goals (Parsons et al., 2012).

Process indicators provide measurable, quantitative information about the specific activities or actions performed by practitioners during the delivery of healthcare services (CASP, 2022). These indicators serve as benchmarks for evaluating the implementation and quality of services provided, offering insight into how care is delivered rather than the outcomes achieved (CASP, 2022).

In the context of ABA services, process indicators define the essential tasks practitioners undertake throughout the client care journey. This includes activities such as conducting assessments, developing and implementing treatment plans, and coordinating discharge planning. Additionally, these indicators encompass interactions with clients and their caregivers, ensuring that services are tailored to meet individual needs and promote caregiver engagement. By tracking process indicators, organizations can monitor adherence to best practices, optimize service delivery, and identify areas for improvement, ultimately contributing to more effective and efficient care (CASP, 2022).

Limitations and Future Direction

As with any study, this study has limitations. One limitation is that we looked at the use of staff training. We did not include the staff's performance within the staff training program. Another limitation is our effect size.

Some areas that we are interested to investigate further and some areas that we would like to empower other researchers to look into:

Run analyses on staff performance (i.e., across programs)

Component analysis of the staff training packages (i.e., frequency, skills, targets, performance, experience of the supervisor)

Examine relationship with treatment integrity

Examine relationship with different client-centered outcomes (i.e., client satisfaction scores, client length of stay, improvements in assessment scoring, client quality of life changes)

Reflections

- Best practices: Does your company offer competency-based staff training?
- Barriers in staff training: What components can be found in your staff training?
- Learner outcomes: How are you defining outcomes?
- Staff training and outcomes: Is your organization measuring the impact of staff training on outcomes of interest?

Appendix

Table 1

Wilcoxon Signed-Rank Test Results for Control and Experimental Groups

Group	N	Negative Ranks (N)	Mean Rank	Sum of Ranks	Positive Ranks (N)	Mean Rank	Sum of Ranks	Ties	Z	p-value
Control	286	-	-	-	-	-	-	-	1.713	.087
Experimental	286	102	136.41	13,914	170	136.55	23,214	14	-3.581	<.001

Note: Negative ranks refer to cases where post-test scores were lower than pre-test scores, while positive ranks refer to cases where post-test scores were higher. Ties indicate no change in scores. The Wilcoxon signed-rank test was used to determine statistical significance. p-values less than .05 indicate statistical significance.

Table 2

Mann Whitney U Test Results for Control and Experimental Groups

Timepoint	Group	N	Mean Rank	Sum of Ranks	U	Z	p-value
Pre	Experimental	286	297.46	85,073.00	37,764.00	-1.588	.112
Pre	Control	286	275.54	78.805.00			
Post	Experimental	286	317.80	90,891.00	31,946.00	-4.531	<.001
Post	Control	286	255.20	72,987.00			

Note. U = Mann-Whitney U statistic; Z = standardized test statistic; p = significance value; r = effect size. p-values less than .05 indicate statistical significance.

Table 3
Quade's ANCOVA Test Results

Source	SS	df	MS	f	p-value	η2
Corrected Model	3,620,695.40	2	1,810,347.70	86.070	<.001	.232
Intercept	3,595,370.01	1	3,595,370.01	170.936	<.001	.231
Pre-test Rank (Covariate)	3,060,287.68	1	3,060,287.68	145.497	<.001	.204
Allocation	397,818.43	1	397,818.43	18.914	<.001	.032
Error	11,968,006.60	569	21,033.40			
Total	62,539,749.00	572				
Corrected Total	15,588,702.00	571				

Note. SS = Type III Sum of Squares; MS = Mean Square; F = F-statistic; p = significance value; η^2 = partial eta squared. p-values less than .05 indicate statistical significance.

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