
Forecasting Success:

Building a Data-Driven APP Fellowship Model

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Objectives

- 1 Describe core data elements used to predict APP fellow performance and progression patterns.
- 2 Analyze how risk-tiering supports individualized learning and programmatic decision-making.
- 3 Explore practice examples demonstrating how analytics can improve training efficiency.

Why Predictive Analytics

Education is entering an era where predictive analytics can transform how we support learners.

The Traditional Education Paradigm

How Have We Traditionally Monitored Fellow Progression?

- End-of-rotation evaluations → provide periodic snapshots of clinical performance.
- Faculty and preceptor observations → offer valuable contextual insight based on direct learner interactions.
- Competency milestones → assess progression toward expected educational outcomes.
- Individual assessment tools (e.g., examinations) → are often interpreted independently.
- *Educational interventions are frequently initiated after a learner demonstrates persistent performance concerns or fails to meet expected progression.*

Traditional evaluation answers the question: *"How is the learner performing today?"*

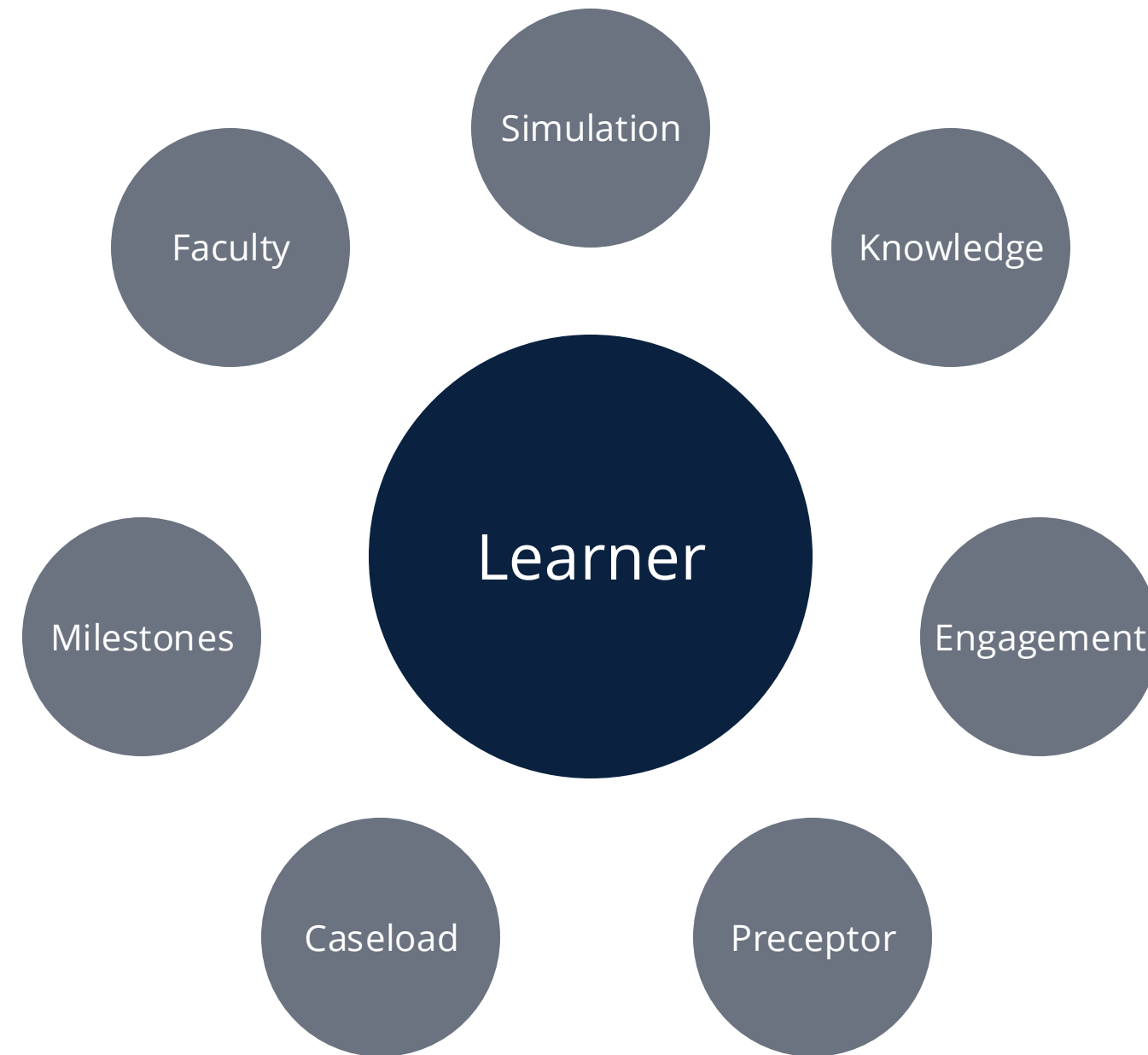
It does not consistently answer: *"Where is this learner likely to be three months from now?"*



Descriptive

How is the learner doing?

The Problem with Traditional Evaluation



The challenge is not collecting more data.

The challenge is transforming educational data into meaningful educational intelligence.

From Evaluation to Prediction

Traditional educational assessment tells us where a learner has been.

Predictive (learning) analytics helps us anticipate where a learner is going.

Traditional Educational Evaluation	Predictive (Learning) Analytics
Periodic assessment	Continuous monitoring
Reviews individual performance measures	Integrates multiple performance measures
Describes current performance	Identifies performance trajectory
Responds after concerns become evident	Detects subtle changes before concerns escalate
Supports remediation	Supports proactive intervention
Answers: <i>"How is the learner doing today?"</i>	Answers: <i>"Where is this learner likely to be next?"</i>



Predictive (Learning) Analytics

...is the systematic integration of multiple educational data sources to identify learner trajectories, estimate future educational risk, and support timely, individualized interventions.



Building FellowTrack

FellowTrack was developed to shift educational decision-making from reactive to proactive.

Educational Drivers

Educational Need	Why It Matters
Monitor longitudinal progression	Learner development occurs over time, not at isolated assessment points.
Integrate multiple educational measures	No single assessment fully reflects learner competence or progression.
Support objective decision-making	Educational decisions should be informed by multiple sources of evidence.
Identify risk earlier	Earlier recognition creates opportunities for coaching before formal remediation becomes necessary.
Individualize learner support	Different learners require different educational interventions based on their unique strengths and developmental needs.

The Five Pillars of FellowTrack

Pillar 4: Risk Stratification

Educational data are translated into meaningful risk categories that help educators recognize which learners may benefit from additional monitoring, coaching, or structured educational support.

Purpose: Convert complex educational data into actionable educational insight.

Pillar 5: Targeted Educational Intervention

Predictive analytics has value only if it informs action. FellowTrack links risk identification to individualized educational strategies designed to support learner development before significant performance concerns emerge.

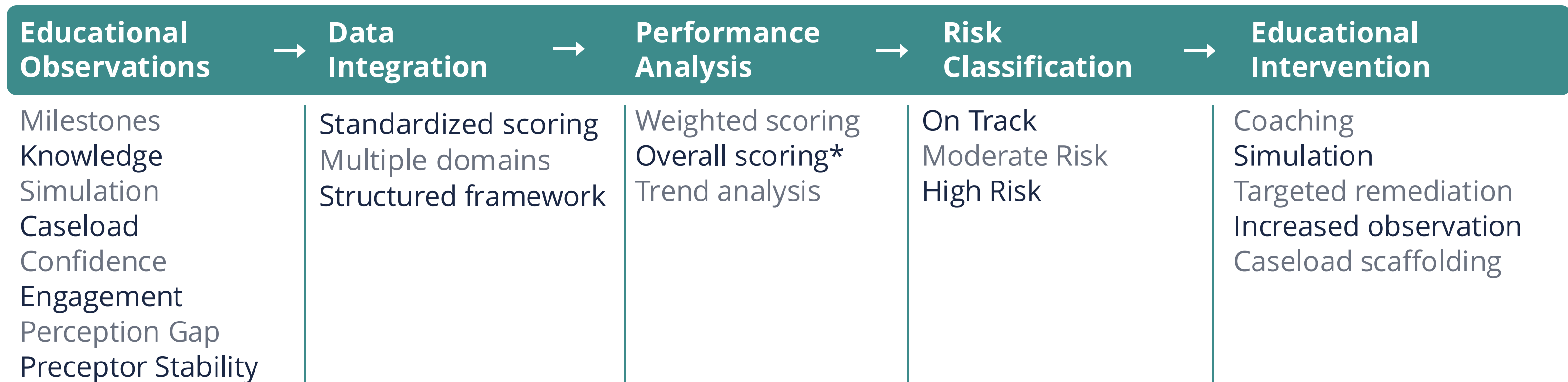
Purpose: Support timely, individualized educational decision-making.



FellowTrack

"What is this learner's trajectory, and what educational support will best promote future success?"

How FellowTrack Works



FellowTrack is not a one-time assessment. It is a continuous decision-support framework that evolves alongside learner development.

Selecting the Right Variables

The quality of any predictive model depends on the quality of the variables it includes.

Variable Selection Matters

Each variable was intentionally selected because it met six educational criteria.

Selection Principle	Why It Matters
Objective	Variables should be measurable using standardized criteria rather than relying solely on subjective interpretation.
Reliable	Measurements should be collected consistently across fellows, evaluators, and time points.
Actionable	Results should guide educational decisions and support meaningful intervention.
Educationally Meaningful	Each variable should represent an important dimension of learner development or competency progression.
Available	Data should be routinely collected within fellowship operations without creating additional administrative burden.
Predictive	Variables should contribute to identifying learner progression and potential educational risk over time.



Selection Matters

The goal was to identify the smallest set of variables that collectively provided the most comprehensive picture of learner progression.

Constructing the Model

Not every variable is measured at every milestone and that's intentional.

Variable Selection Matters

Information is entered throughout the fellowship – not just at a single point in time.

Variable →	Boot Camp →	Month 3 (M3) →	Month 6 (M6) →	Month 9 (M9)
Perception Gap	-	✓	✓	✓
Milestone Achievement	-	✓	✓	✓
Caseload Achievement	-	✓	✓	-
Knowledge (Rosh)	Initial (8 weeks)	✓	-	Repeat
Simulation	Initial (8 weeks)	✓	-	Repeat
Confidence	Baseline (4-5 weeks)	-	-	✓
Preceptor Stability	-	✓	✓	✓
Engagement	✓	-	-	-

Looking Beyond Scores

How is that learner changing over time?

Using the Model

Educational analytics have little value unless they are presented in a way that supports timely decision-making.



Applying FellowTrack

The focus is on educational decisions not scores.

