



Blueprint for Inclusive Research and Development in Education (BIRD-E)

Comprehensive Report: Practitioner Working Group

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A project by InnovateEDU



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Overview and background

The healthcare sector has seen major improvements with interoperability and the usage of common data elements due to the implementation of an agreed-upon research framework, PICO (Population, Interventions, Control or Comparison, and Outcome). This has yielded paradigm shifts in understanding of health research questions and outcomes. Wide-scale clinical trials use the PICO framework so that various actors can categorize and report outcomes in a universally understandable format. Researchers rely on this framework to chart medical conditions, environmental factors and report on other factors that may affect patient outcomes. This enables doctors nationwide to collaborate on the same studies, despite varying local environments and patient profiles. It also allows researchers to interpret and report findings, and track expected outcomes and anomalies in interventions.

The education sector needs an accepted underlying data framework for research and development. There is a need for a universal framework that allows for data elements to be categorized and captured in an organizing framework like PICO, along with an accompanying framework that allows for comparability and searchability within findings. Existing education data is scattered across research institutes, research-practice partnerships, grant funding reports, product developer reports, longitudinal studies, product indexes, reviews, and anecdotal teacher accounts—with no means to make sense of it or to systematically examine anomalies. Moreover, a new format for collecting data emerges with every new research question or model.

From a practitioner’s standpoint, research is cumbersome to navigate and often inaccessible. For example, only [18% of administrators](#) feel that there is enough evidence-based information to make digital learning decisions for their schools. Practitioners do not have time to sift through different resources; they want to figure out the best practices immediately. Research tends to sit in evidence bases, lacking direction on how to be used. As practitioners’ research needs grow, the wide gap between these needs and the actionable research available continues to expand. Two big questions that currently plague the sector are how to effectively optimize research for practitioners and how to create a useful and usable knowledge base.

The Blueprint for Inclusive Research and Development in Education (BIRD-E) project is a multi-stakeholder initiative to develop a data framework that researchers and practitioners can use to understand, interpret, and synthesize data in education R&D. Modeled on the PICO (Population, Intervention, Control or Comparison, and Outcomes) framework in healthcare, this is a research and development project that builds a key piece of research infrastructure for the sector.

The aim of this project is to develop an open-source data framework that researchers and practitioners can use to understand, interpret, synthesize, and organize data in education R&D. A universal data framework that leverages existing data standards will create models for researchers and practitioners to share information, thus increasing efficiency and effectiveness by 1) lowering barriers to entry for

monitoring and evaluation design, and 2) lowering costs by reducing the number of customized data variables in every study. The framework allows for a wide set of resources to be meta tagged for consideration into the research practice and for data to be captured into digestible data profiles. Ultimately, it democratizes research and makes it consumable by researchers and practitioners.

With support from the Bill & Melinda Gates Foundation, InnovateEDU is stewarding the creation of a shared infrastructure through regional data capacity and infrastructure investments, with a focus on data privacy and security. Given the long-standing challenges of data in education, it was important to create a collaborative ecosystem of stakeholders who are deeply engaged in determining what types of data will be most useful. The design process should attempt to create consistency through open standards and open-source approaches to be extremely attentive to the challenges faced by historically underserved and poorly served communities -- Black, Latinx, and low-income and disabled students, as well as their teachers. It was also important that this process focus on the inherent tensions of creating common approaches in a decentralized education world and thus careful examination of scalability, adoption, and ecosystem considerations was needed from the very beginning.

InnovateEDU, in collaboration with designated stakeholders, was entrusted to develop and test an open source data framework that researchers and practitioners can use to understand, interpret, synthesize, and organize data in education R&D. This project was required to take an intentionally thorough approach, requiring a diverse group of participants in the design.

Following a series of design workshops, InnovateEDU created an ecosystem of collaborators and stakeholders to build an R&D infrastructure that will be:

- **Pilotable:** There is a way to test the prototype infrastructure in the real-world ecosystem.
- **Impactful:** The prototype and the pilot should produce preliminary evidence of potential impact within the first few years of implementation. Evidence might include reduced costs to run validation studies, more efficient testing, increased school engagement with research, enhanced shareability of results of studies, improving the quality of user engagement in the R&D process, etc.
- **Advances Diversity, Equity, and Inclusion:** The infrastructure must operate within target communities. Furthermore, the leadership of the infrastructure and those participating within the design process should be representative of the target populations.

The proposed prototype's objectives are to:

- Articulate an open source, data needs framework that emerges from an inclusive, multi-stakeholder engagement approach and from data-driven methods for evaluation.

- Test the framework’s ability to generalize beyond a specific research project through a rapid cycle evaluation in the Bill & Melinda Gates Foundation’s (BMGF) R&D portfolio with four or more field pilots.
- Create natural links among other collaborations currently examining the intersection of data in education, such as T3 from the U.S. Chamber of Commerce, ADL, EdMatrix, IEEE, and other efforts underway to organize data and interoperability in the K-12 education data space.
- Engage other projects within the BMGF education portfolio, especially the efforts with Mathematica and Northwestern, to enhance engagement and collaboration between projects that handle meta tagging infrastructure within K-12 education. In particular, we should leverage the work with the Education Endowment Fund to create international cohesion for this work.

The anticipated long term success outcomes are two-pronged:

- Efficiency and effectiveness. Demonstrate efficiency through cost reduction to run research studies, increase school engagement with research, enhance shareability of study results and improve user engagement in R&D process.
- Replicability and scalability. Create sector-wide replicability and scalability of a framework for different research needs of practitioners and other stakeholders.

The Practitioner Working Group, composed of diverse stakeholders representing practitioners from different types of organizations, formed in May 2020 to officially initiate the design, development and implementation of the proposed R&D infrastructure. The collective contribution of this group is to spearhead the work under the leadership of InnovateEDU to:

- Understand the types of data that need to be collected to inform the development of the framework.
- Review the deployment of methodology under the guidance of the Steering Committee.

This contribution would be aimed at leading the development of a data framework for education R&D and to guide and supervise the prototype implementation of that framework.

This work was organized by InnovateEDU, which chaired the Steering Committee and Working Groups in a convening and workshop sequence to analyze existing methodologies, identify needs and gaps within the researcher and practitioner communities, and build a data framework that could be tested in four pilots within the BMGF R&D portfolio.

Constitution: Practitioner working group

Through a clear and deliberate due diligence process, InnovateEDU selected 14 practitioners representing a diverse group of stakeholders to serve on the Practitioner Working Group. The group's purpose is to create, influence, and counsel the direction of the BIRD-E project. The group, which began meeting in May 2020, is expected to continue until July 2022. The members and organizations are listed below, in alphabetical order.

- ★ Adrienne Murphy, Massachusetts Department of Early Education and Care
- ★ Chelsea Waite, Center on Reinventing Public Education
- ★ David Nitkin, Transcend Education
- ★ Harpreet Gill, Achievement First
- ★ Howard Shen, Summit Public Schools
- ★ Jake Firman, DSST Public Schools
- ★ Karina Rodriguez, Highlander Institute
- ★ Kenneth Herrera, Uncommon Schools
- ★ Leonard Medlock, Students Rising Above
- ★ Margeaux Randolph, Los Angeles School of Creativity & Technology
- ★ Megan Benay, Great Oaks Charter School District
- ★ Michael Ricci, Redwood Software
- ★ Roland Antoine, Texas Education Agency
- ★ Sean Talamas, Character Lab

Members were invited based on their areas of expertise representing school districts and research intermediaries providing technical assistance directly to the school system or partners. There were several drivers and reasons for members to join this large-scale stakeholder engagement process and spearhead the work with InnovateEDU. Many of the members are already focused on research and evidence's role in improving the outcomes for students, especially marginalized populations across the country. By participating in the Working Group, the members agreed to be part of an initiative where they had the ability to support and co-create a movement that has a greater impact on student outcomes.

Norms and expectations were established with a clear outcome for this engagement: to create a unified system that allows understanding of what can happen in all schools, that allows translation of complex information to enable teachers and researchers to make improvements beyond what is possible - to truly know what works, where, for whom and under what circumstances in education.

Purpose: Practitioner working group

The Working Group participated in all the key responsibilities and engagements as identified by InnovateEDU in collaboration with the community members, especially the Steering Committee. These included:

1. **Gap analysis:** Identify the gaps and challenges of the education R&D ecosystem.
2. **Models of success:** Identify models of success from other industries to inform the design.
3. **Design and composition:** Be a part of the design and determine the composition and engagement process.
4. **Decisions and approval process:** Establish work flows and decision processes of the Steering Committee and Working Group members.
5. **Strategic roadmap and methodology:** Establish the strategic roadmap of the project and design the comprehensive methodology of the project.
6. **Pilot the prototype:** Select and identify the pilot sites with clear learning objectives, and participate in supervision of the pilot and advise on the integration of the learnings in the framework development.
7. **Finalize the framework:** Finalize the draft of the framework, naming, and mission and vision documents for external release.
8. **Communication and dissemination strategy:** Finalize the framework and co-design the dissemination strategy for different stakeholders.

Members of the Practitioner Working Group were specifically charged with the following responsibilities and engagement to support the development of the framework:

1. **Design use cases and persona profiles:** Design use cases and persona profiles to influence the development of the framework.
2. **School district pilot process:** Design, implement and review the school district pilot to inform framework development.

InnovateEDU, in collaboration with the Practitioner Working Group and the Steering Committee, mapped each of these responsibilities and established formal processes and protocols for each of them. The specific details of each of these are explained in the section below.

Key responsibilities and engagements

1. Design use cases and persona profiles

The Practitioner Working Group was responsible for creating the prioritized use cases with input and feedback from the Steering Committee and other collaborators and stakeholders. The group considered the needs of stakeholders such as teachers, principals, central officials at the district or charter management level as well as researchers and education technology companies. These use cases provided context for the alpha and beta pilot testing, focusing on what these stakeholders are trying to accomplish by using the framework and the underlying challenges they face in education research and development. It is anticipated that pilots may not address the full scope of one or more of these use cases. Rather, the pilots will select elements or aspects of the use cases that fit their scopes and priorities.

The Practitioner Working Group identified the stakeholders for each of the use cases and defined the preconditions, flow of events and success criteria for each of the use cases. The main stakeholders are defined and described in the table below.

1. **Primary Actor:** Primary actor and major goal.
2. **Actors:** The actors (stakeholders, systems, persona) involved in the use case including the primary actor initiating interaction with systems to achieve goals.
3. **Preconditions:** List of assumptions to be true or present for the use case and flow of events.
4. **Flow of Events:** Numbered steps that describe the use case scenario.
5. **Success Criteria:** The ideal result in a successful scenario.

Table 1. Stakeholders and systems involved in sector

Category	Type	Description
Stakeholder	Teachers	Use the data dashboard system with embedded framework to analyze the data reports for their students to identify gaps and make choices about curricular and behavioral choices.
Stakeholder	Principals	Use the data dashboard system with embedded framework to design the right questions and analyze school-wide data to identify gaps in instructional practice and support students and teachers. Additionally, use the evidence synthesis repositories with embedded framework to filter the right research reports and identify evidence-based practices for the school.
Stakeholder	EdTech companies	Use the framework to embed in their data collection and reporting system to provide a comprehensive reporting structure to their partners.

Stakeholder	Researchers	Use the framework to identify the right questions for research, articulate the data needs to the informaticians and practitioners to collect adequate and appropriate data for research. Also, use the conceptual framework (PICO) to report the findings in a way that can be understood, interpreted and translated into practice by decision makers.
Stakeholder	Central Officials involved in research	Use the framework to identify research questions to mobilize the internal research and evaluation teams or third party evaluation teams to conduct research. This will facilitate appropriate and targeted intervention choices for students based on their instructional needs. The same framework can be used to assess the effectiveness of the interventions and answer the questions about which interventions work for whom and in what context.
Stakeholder	Students	Use the comprehensive learner profile system to assess their work and determine what improvements are needed. The framework encourages interoperability across data systems and allows for comprehensive data collection for improved learner profiles.
System	Data dashboard system	Available for all stakeholders to conduct research and analysis to identify gaps in instructional or behavioral practices. It provides a managed data infrastructure that ensures data anonymity for large scale research. Combined with appropriate analytical and visualization tools it will assist all evidence generators to become active participants in research and development in the education sector.
System	Data systems	Use of data framework by different data systems will reinforce the need for interoperability among data systems (Ex: LMS, SIS, RTI systems, assessment systems).
System	Evidence synthesis repositories	Use of data framework to report findings in an interpretable and understandable format to practitioners to enable discoverability and comparability of findings that will enable better decision making for students and teachers.

PRIORITY USE CASE: RESEARCHERS OR RESEARCH PRACTICE PARTNERSHIPS

ACTORS, ACTIONS & NEEDS		
ACTOR	PRIMARY BEHAVIOR & ACTIONS	NEEDS & PAIN POINTS
Researcher Asst. Professor University	<ul style="list-style-type: none"> ● Research focus: intervention research and its ability to support evidence-based policy and practice in education ● Applies for grants to conduct large-scale studies on intervention research in education ● Designs and implements research practice partnerships with districts to understand impact of interventions on student outcomes ● Conducts applied research for developing guidance for exploratory studies ● Produces guidance reports on process evaluations of complex interventions in education 	<ul style="list-style-type: none"> ● Challenges in obtaining clean data ● Difficulty in getting sufficient implementation data from schools ● Fragmented datasets in different formats and repositories ● Issues re: costs in replicating studies due to customized research
Research Practice Partnerships	<ul style="list-style-type: none"> ● Provides evaluation and effectiveness studies as well as technical assistance to partners ● Provides evidence to practitioners and policy makers to use re: program implementation, challenges and solutions 	<ul style="list-style-type: none"> ● Lack of good-quality data across multiple sites for robust evaluation ● Inaccessibility to all data systems for systematic data collection

Goals:

- Design a robust PICO-centric research hypothesis for targeted analysis
- Access comprehensive good-quality data from partners for rigorous and thorough analysis
- Understand and provide evidence for whether contextual variables correlate with outcome data
- Assess whether district leadership decisions have an impact on outcomes for specific groups of students
- Publish research papers and influence the space with well designed research reports

This use case is inclusive of two types of researchers. This can be further extended to different types of research partnerships such as product researchers, internal district research and evaluation teams, rapid cycle evaluators. Viability of a SEA / LEA use case is being explored and will be added at a later date.

PRECONDITIONS

- Articulate research data needs to schools and districts in a comprehensive format
- Clear communication between district and researcher on research purpose and objectives
- Appropriate understanding of framework for its use by district, researcher and or vendor
- Ability to collect data needed for analysis
- Data feeds into a centralized managed data infrastructure
- Data can be anonymized to be merged with other datasets for large scale evaluation
- Articulate implementation data needs to districts and schools and their ability to collect it
- Linkages and interoperable systems to collect all data in one place

FLOW OF EVENTS

Design research questions:

- Use PICO framework to design the research hypothesis
- Use framework to identify all relevant data elements to be collected
- Use framework to establish contextual and implementation variables for research
- Use framework to articulate data needs in the form of data elements
- Use framework to compile metrics for evaluation and its impact on various stakeholders
- Use framework to derive metrics that would be most relevant to assess effectiveness
- Set accountability plan with district on targeted outcomes
- Set periodic checks for data quality

Data collection:

- For data collection, the researcher either coordinates with district or with vendors with due contract in place
- Researcher articulate data needs to collect implementation metrics and quantitative data to district and school team
- Sets structures with district team for appropriate data collection
- Establishes frequency of data from different data systems
- Creates checks and balances for quality of data

Impact evaluation:

- Researcher conducts analysis using collected data
- Observes correlational data between outcomes and implementation, reach and dosage for targeted groups of students
- Observes alignment of digital tools and intervention services with teaching and learning models
- Understands ed tech effectiveness on student outcomes
- Uses framework to report out findings of the study
- Shares findings with the district and vendor

- Incorporates any feedback received
- Publishes paper within 1 to 3 years of study to impact marketplace
- Uses framework to report metrics to the state for accountability reports (if in scope)

SUCCESS CRITERIA

1. Researcher is able to capture and integrate all necessary data points for research
2. Researcher can assess student growth for specific and identified student groups
3. Researcher is able to produce evidence that clearly reports on intervention impact on targeted student groups
4. School and district teams understand and collect the data needs of researchers
5. Implementation variables are collected and analyzed without loss of information
6. Analysis can be reported and translated into practice

PRIORITY USE CASE: EDUCATION TECHNOLOGY COMPANIES

ACTORS, ACTIONS & NEEDS

ACTOR	PRIMARY BEHAVIOR & ACTIONS	NEEDS & PAIN POINTS
Edtech company Focus: English Language & Arts (ELA) <ul style="list-style-type: none"> ● Personalized ● Scaffolded supports ● Differentiated small group instruction 	<ul style="list-style-type: none"> ● Design effective subject specific technology solution to improve student outcomes ● Adapt to the learner and personalize instruction from intervention through enrichment ● Provide equitable access to all types of students aligned to state and regional standards ● Provide practitioners with actionable data through effective visualization for better decision making 	<ul style="list-style-type: none"> ● Limited understanding of data needs to study impact ● Lack of alignment of product data with Student Information systems / Learning Management Systems data ● Dashboard lacks reporting on specific trends and analysis on student subgroups ● No structure or process to collect implementation variables and contextual design data elements to provide recommendations on dosage aligned to specific student profile, technology requirements, teacher capacity requirements, etc.

Goals:

- Use evaluative research to inform product development
- Produce research on usability and effectiveness

- Use data to generate success models and create best practice recommendations for usability and criteria for dosage and time on schedule.

This use case is focussed on education technology products used in the classroom and can be expanded to include other types of vendors such as SIS, LMS, RTI tools etc.

PRECONDITIONS

- Ability to link product and district data system to ensure interoperability leading to all data in 'one place'
- Appropriate understanding of framework for its use by district, researcher and/or vendor
- Clear communication between district and researcher on purpose and research objectives
- Data can be anonymised and can be merged with other data for large scale evaluations
- Articulate implementation data needs to districts and schools and their ability to collect it

FLOW OF EVENTS

Data alignment and collection:

- Product team of the vendor downloads a data framework from the resource hub to identify data elements in different domains such as demographics, contextual variables, assessment, learners.
- Identify all data relevant for effectiveness study
 - Aligned with FERPA law, design product features to collect data points relevant to product development through APIs
 - Identify all elements to be collected by school for comprehensive product effectiveness evaluation
 - Communicate these elements to schools for systematic data collection

Data analysis and synthesis:

- Product aligns and integrates its data system with the data dashboard system of the district or school
- District data dashboard system collects all data pertaining to demographics, product usage, implementation data, assessment data, etc.
- Product team either uses this data to conduct analysis in partnership with the district or school or collaborates with a third party evaluation team (researchers) as identified by the district or school.
- Research is produced and reported using the framework

SUCCESS CRITERIA

1. Digital solution providers (through the framework) are able to comprehensively collect data and

- use it to assess product effectiveness, design improvements or define success criteria for usability and impact outcomes
2. Product team uses framework to design their data systems and meet the technical requirements set by the district
 3. Vendors can collaborate with the district to set long-term contracts by setting appropriate accountability metrics by collecting the right unit of data to provide to the district or school. This can be facilitated through the use of framework.

PRIORITY USE CASE: CENTRAL OFFICIAL (DISTRICT OR CHARTER)

ACTORS, ACTIONS & NEEDS		
ACTOR	PRIMARY BEHAVIOR & ACTIONS	NEEDS & PAIN POINTS
Chief Academic Officer	<ul style="list-style-type: none"> ● Choose appropriate interventions for closing the achievement gap ● Ensure appropriate systems for data collection and implementation fidelity metrics ● Understand impact of different interventions through effectiveness research 	<ul style="list-style-type: none"> ● Limited evidence of what works, when and how ● Limited support from vendors (interventions and data systems) ● Lack of implementation data and its fidelity metrics to understand variance in learning environments
Director of Research & Evaluation	<ul style="list-style-type: none"> ● Assess impact of interventions on student outcomes ● Provide due diligence support to CAO for decision making ● Establish systems for data collection ● Design appropriate research questions based on district priorities and conduct evaluations 	<ul style="list-style-type: none"> ● Lack of contextual variables to measure impact ● Need for a data model to collect comprehensive data for analysis ● Lack of criteria to assess data collection capacity among vendors
Director of Technology	<ul style="list-style-type: none"> ● Establish data systems across districts ● Integrate LMS, SIS and EdTech systems into a managed infrastructure that allows for seamless implementation and data collection ● Vendor management for appropriate 	<ul style="list-style-type: none"> ● Lack of interoperable data systems ● Absence of comprehensive list of implementation fidelity metrics ● Lack of data leads to inability to align digital tools to teaching and learning

	<p>data collection compliant with FERPA regulations</p>	
<p>Goals:</p> <ul style="list-style-type: none"> ● Understand effectiveness of interventions to identify gaps in instructional practices and choose the right interventions for the targeted group of students. ● Understand and use ‘pay for success’ model in the district to improve student outcomes ● Understand whether contextual variables have good correlation with outcome data ● Assess whether leadership decisions led to improved student outcomes for student groups ● Evaluate price vs. cost of an intervention against outcome data ● Evaluate cost efficiencies in intervention choices and use it to build a multi-year accountability plan with vendors 		
<p><i>These actors demonstrate the composition of a typical mid-size district in the country. Some smaller or rural / near urban districts or other types of school systems (ex: charter, private, catholic etc.) may have a different composition depending on size, district priorities and needs.</i></p>		
<p style="text-align: center;">PRECONDITIONS</p>		
<ul style="list-style-type: none"> ● All stakeholders involved in the process (district/researchers/vendors) should understand the use of framework and conceptual framework to design research questions and conduct analysis ● Clear communication is needed between data and procurement department to use effectiveness studies in facilitating procurement decisions ● All data feeds into a managed data infrastructure that allows centralized access ● Ability to mobilize all data systems in the district to collect appropriate data for analysis ● Communicate a standardized protocol to all schools involved to collect quantitative and implementation data 		
<p style="text-align: center;">FLOW OF EVENTS</p>		
<p>Identify interventions & make procurement decisions:</p> <ul style="list-style-type: none"> ● CAO articulates the need to assess existing interventions in the district to understand learning gaps ● Director of research and evaluation uses the PICO framework to design the right questions for gap analysis ● Research team uses framework for data collection and to identify data metrics and analysis ● Once gaps are identified, the research team and CAO use the gap analysis report to identify interventions through the evidence synthesis hubs and repositories linked to dashboard systems. ● Once the choice of intervention is made for specific student groups, framework is used to inform technical and data requirements from vendors ● Use evidence reports provided by vendors against the framework to understand product 		

effectiveness

- Establish link between research team and procurement department on common metrics for accountability plan
- Research team and the procurement department use the framework to assess data collection capacity of vendors
- Set accountability plans with vendors on targeted outcomes and inform procurement department to include 'pay for success' metrics in contract for accountability
- Adoption of intervention and connect vendors with schools to start implementation

Data collection systems and integrations:

- Director of Research and Evaluation
 - Uses the framework to identify all relevant data elements to be collected for analysis
 - Articulates implementation and qualitative data needs to school teams and vendors
 - Identifies technical integrations needed to collect data in centralized dashboard system
 - Uses framework to derive metrics that would be most relevant to assess effectiveness
 - Uses framework to report metrics for state accountability reports
 - Uses framework to report metrics to donors and private funders for accountability metrics
- Director of Technology creates linkages and interoperable systems to collect all data
 - Establishes frequency of data collection from various systems
 - Creates checks and balances for quality of data
 - Understands EdTech usage and effectiveness of products for procurement purposes
 - Aligns digital tools with teaching and learning supports team

Impact evaluations:

- Director of Research & Evaluation will either conduct internal impact evaluation studies or collaborate with external research practice partners to conduct the evaluation
- In both cases, district will assess implementation fidelity for interventions
- Integrate vendor data with implementation data in dashboard to assess effectiveness
- Design research methods to run effectiveness analysis for chosen interventions
- Results can be reported as:
 - Correlation between implementation variables and student outcome data
 - Correlation between reach, dosage, progress with student outcomes on external assessments
 - Impact analysis vs. cost efficiency to decide among multiple interventions
- Additionally, external researchers can use anonymous data from the district and combine other datasets to conduct peer comparisons nationally to understand effectiveness

SUCCESS CRITERIA

1. District is able to design PICO-centric questions and compile data to conduct analysis
2. District is able to identify all relevant and comprehensive data elements from the framework
3. District data systems are able to capture and integrate all necessary data points
4. District is able to identify interventions that work best for different student groups, and in what context
5. Implementation variables are clearly articulated in framework and is collected and analyzed by the district without loss of information

PRIORITY USE CASE: PRINCIPALS

ACTORS, ACTIONS & NEEDS

ACTOR	PRIMARY BEHAVIOR & ACTIONS	NEEDS & PAIN POINTS
<p>Principal</p> <p>Persona: Low performance of 9th grade students on the state math assessment. Principal is spending a vast amount of time researching evidence-based practices and appropriate suites of curricular programs and interventions to improve student engagement and outcomes rather than supporting teachers with systems and professional development.</p>	<ul style="list-style-type: none"> ● Identify learning gaps for each grade level to choose appropriate curricular programs and interventions based on student needs ● Identify research-driven, evidence-based programs and interventions for students ● Support teachers in implementing instruction based on best practices ● Assess impact of interventions on student achievement, engagement and behavior 	<ul style="list-style-type: none"> ● Create buy-in among department chairs and teachers regarding intervention needs ● Need for a comprehensive curricular program supported by evidence reports, best practices as well as teaching and learning strategies (self regulation, metacognition and feedback) to support teachers ● Use a math curricular program to initiate cooperative culture of learning ● Specificity in contextual variables and demographic information to narrow search
<p>Goals:</p> <ul style="list-style-type: none"> ● Aim to improve math achievement scores for students in end-of-year and state assessments by choosing an appropriate evidence-based curricular intervention that increases student engagement. ● Identify a comprehensive math program effective for their student community. 		

PRECONDITIONS

- The data dashboard system uses a framework to collect all data in a user-friendly reporting format.
- The data system has the ability to either collect or integrate the contextual and implementation variables sourced from the framework.
- The data dashboard system in the school or district has teacher and administrator-specific reports that can be viewed and understood by the instructional lead teacher and principal.
- Intervention data is linked with other student data points to showcase a comprehensive learner profile.
- Evidence base includes reports that are research driven and can be translated into practice.
- The data system links to different resources that provide research-based intervention reports in an understandable format for teachers and principals to consider adopting.

FLOW OF EVENTS

- Principal opens the data dashboard system of the school to view school-wide and grade-level reports of their students.
- The necessary report provides comprehensive data points including demographics, learner profile, behavior, assessment and interventions at grade level, student level and class level.
- Principal analyzes school-wide data trends and identifies gaps in instructional practices and curriculum with the support of their Instructional Leadership Team (ILT).
- The ILT connects to the evidence synthesis repositories linked and embedded in the dashboard to access interventions that support students in improving specific skills. The repositories provide evidence on summaries, effectiveness, benchmarks, ratings on research design and cost effectiveness.
- Principal and the ILT identifies interventions and plans for adoption and implementation for different grade levels.
- School technology specialists integrate interventions with curriculum aligned school schedules and any technology requirements for implementation.
- The ILT collects data in the dashboard system for contextual or implementation variables to be integrated with other data systems for analysis.
- The ILT supports teachers to adopt interventions for targeted student groups.
- Data dashboard provides regular updates to teachers on student progress and needed modifications.
- Principal and the ILT team analyze data on regular basis to adjust interventions under these following scenarios:
 - Increased growth scores in the first quarter; continue interventions
 - Marginal improvement; continue to review final end-of-year growth scores
 - No or negative growth; discontinue intervention to start the search again

SUCCESS CRITERIA

1. Principal and the ILT team are able to access and review data reports from centralized data dashboard systems including student demographic data, behavior data and interventions data to gauge a comprehensive profile.
2. Principal and the ILT team are able to ask appropriate research questions about their students' growth through the dashboard system and access data reports to do their own analysis and are able to change course of action if needed.
3. Data dashboard system collects different variables from the framework and reflects the most current real-time metrics for students.

2. School district pilot implementation

Great Oaks Charter School District is based in New York City with a mission to provide students with a rigorous curriculum in a nurturing environment. The school's guiding principles of mastery, leadership and community ensure the support of all of their students in becoming compassionate leaders. Great Oaks Charter schools administer coaching and professional development services to teachers based on observations. The objective of this pilot was to use the alpha Blueprint framework to design a research question to correlate teacher observations and ratings with standardized student assessments, with the goal of identifying targeted coaching interventions for the staff.

The evaluation process entailed two distinct approaches:

1. Assess the applicability and coverage of the Blueprint by cross-mapping the modules and submodules of the Blueprint against the established evaluation framework of different pilot partners.
2. Create a research question with the partners using the Population, Intervention, Comparison and Outcome framework and use the Blueprint to identify and classify the elements needed for evaluation in the specific context of the research question.

The success of the pilots was measured by three major criteria:

- **Coverage:** The number of elements mapped as a percentage of the total number of elements identified to represent the education data needed in the evaluation frameworks of the pilot partners.

- **Understandability:** The assessment of clarity in definitions and understanding of the elements by other stakeholders. The precision, organization and ambiguity was assessed using qualitative and quantitative data.
- **Generalizability:** The extent to which the elements, modules and sub-modules are aligned to real-world application and experiences. The generalizability was calculated as a median of the coverage for all pilots and aggregated the scores of all pilots to determine the overall generalizability of the Blueprint.

Great Oaks Charter Schools strives to have continuous improvement in teaching and learning, so administrators determined that teacher evaluation should be the main focus for this pilot. More so, the alpha Blueprint framework had no elements related to teacher evaluation, so both teams wanted to assess how effective the Blueprint was in identifying variables that would answer questions related to teacher evaluation. Great Oaks utilizes the Teachboost platform, which provides teacher evaluation and coaching tools. Teacher evaluations are also based on student assessment scores. BIRD-E used the rubric found on Teachboost and pulled all relevant elements related to teacher evaluation and staff identifiers. BIRD-E also used the NWEA assessment fields to pull student identifier elements. Fifty-two relevant elements were found in total from the Teachboost rubric and NWEA assessment.

All 52 elements were mapped to the Blueprint. Twenty-three Blueprint elements were mapped to the identified elements. The overall coverage of elements mapped was 44.23%. This pilot revealed a big gap in the Blueprint – that it did not contain any elements specifically for teacher evaluation. Although it contains elements adjacent to teacher evaluation, like staff identifiers, student identifiers, and standardized scores and academic subjects. The pilot also revealed another gap: type of assessment in the Blueprint. The Blueprint is strong in coverage of summative assessments, but not formative assessments. Great Oaks Charter Schools relies on both types of assessments to assess teachers and determine coaching implementation.

This pilot demonstrated the use case for districts, as the research teams in districts can utilize the Blueprint to assess intervention-based outcomes for their students.

Conclusion

It is increasingly evident that education research is critically needed to improve our education systems and to open up opportunities for learning. However, our R&D infrastructure in education is woefully inadequate. Not only do we underinvest in the necessary infrastructure, education research is not currently structured optimally to impact educators' decisions. Educators and system leaders don't have access to the bodies of research and findings that could support high-quality teaching and learning, and

scholarship is too often disconnected from practice (and policy). Equity is often an afterthought or is measured in simplistic and reductive ways, which prevents effective implementation.

If our goal is for research to inform more equitable teaching and learning in education systems, then we must both invest in and reimagine R&D infrastructure in education. There is a need for new systems that help us answer questions about what works for whom, how and under what conditions. We need to create systems that facilitate data generation and the sharing of research findings, and improve the translation of research syntheses. This will allow for better accessibility and discoverability of research by practitioners, researchers and policy makers for decision making.

The BIRD-E project used a data-driven approach to develop a conceptual framework - the Blueprint - for defining education research data needs. The resulting Blueprint is an open-source framework that aims to modernize education research through a common, research-based data language to bridge the divide between research and practice in the K-12 data ecosystem. The Blueprint aims to provide a structured, universal and consistent approach to design, collection and reporting of research to answer the most pressing questions facing educators. It serves as a map to modernize current K-12 research, so that impactful research cannot only be conducted -- but actually used.

The Blueprint can become the foundational R&D infrastructure needed to create a common comprehensive research framework and create a shared vocabulary to articulate research data needs. Its goal is to facilitate engagement of all types of stakeholders in inclusive, accessible and robust generation and use of research. The Blueprint focuses on supporting a learning system within the research and development infrastructure that evolves and considers usability in the practitioner community. It can facilitate communication between researchers and practitioners to ensure improved evidence generation as well as serve as a metadata framework to index and organize research evidence bases for better discoverability in the space of evidence synthesis. Further real-world adoptions and close studies are needed and warranted to test these potentials and serve the education sector.