



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

BIRD-E Pilot Profiles & Lessons Learned

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Introduction

The 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. Its goal is to facilitate engagement of all types of stakeholders in inclusive, accessible, and robust generation and use of research. The Blueprint serves as a map to modernize current K12 research, so that impactful research can not only be conducted -- but actually used. The Blueprint aims to provide a structured, universal and consistent approach to design, collection, and reporting of research to answer the most pressing question of what works, for whom, and under what conditions. The Blueprint focuses on supporting a learning system within the research and development infrastructure that evolves and considers usability in the practitioner community.

The Blueprint contains a list of critical data elements that summarize and represent key education data needs in early childhood and K-12 education. It is a translational layer to improve articulation of data needs among researchers, practitioners and solution providers. The Blueprint provides a framework to design a well formulated research hypothesis, identify and articulate data needs to effectively evaluate impact of an intervention. It allows the reporting of findings in a consistent and structured format to make it accessible and discoverable. The direct beneficiaries of the Blueprint include researchers and research practice partnerships, solution providers, federal and state evaluation agencies, as well as decision makers in the school systems.

The design of the Blueprint, under the Blueprint for Inclusive Research and Development in Education (BIRD-E) project, was informed by a user-driven pilot process spanning different types of stakeholders to understand the Blueprint's potential gaps in the design. It also tested for the ability of adoption in diverse contextual settings. The field-driven design process was critical to incorporate stakeholder voices and pressure test the Blueprint for variability and generalizability.

InnovateEDU undertook a lean, agile development approach focused on rapid cycle improvement to produce an initial minimum viable product, or an alpha framework, to be tested in the pilots. The pilots provided an examination of the relevance of the Blueprint with other frameworks and standards across the education sector, with the aim to improve the Blueprint for wide-scale adoption. This additional evaluation and learning helped generate a beta framework ready for scalability and replicability.

Pilot selection

The pilot process was divided into two lean development phases to aid agility and rapid development of the Blueprint: Alpha and Beta pilots. Sites among both sets of pilots were carefully selected to ensure

representation of current education stakeholders and to reflect the challenges faced by each of them which could be facilitated or alleviated by the Blueprint.

Before the initial compilation of potential pilot organizations, selection criteria was established with the consensus of Steering Committee members and the Bill & Melinda Gates Foundation as well as InnovateEDU. The selection criteria were informed by a combination of technical and operational needs. The selection criteria are listed below:

- 1. Data sharing agreement:** The organization is able to sign the InnovateEDU data sharing agreement. This included the FERPA, COPPA, and HIPAA compliance indicators in the agreement. The anticipated benefit was compliance with student security and privacy measures.
- 2. Framework design participation:** The organization should be able to join the practitioner or researcher working groups and commit to participation in the design of the framework. This ensures that the design process of the framework development is diverse, connected, and inclusive.
- 3. Design workshops:** The organization should be able to schedule co-planning meetings and design workshops with the InnovateEDU team. This facilitated customized use cases and presented the challenges of scalability within the pilot that could be discussed and solved for.
- 4. Data infrastructure:** The organization should have the technical capacity and tooling to initiate the use and implement the draft framework. It ensured that the framework would be tested against different types of data infrastructure and that data teams could validate the replicability and scalability measures.
- 5. Progress monitoring:** The organization, in collaboration with the InnovateEDU team, has clear and measurable outcomes for the pilot. This was critical to understanding and testing for efficiency and effectiveness.

Based on the selection criteria, 11 pilot sites/organizations were identified and shared with the Bill & Melinda Gates Foundation. With critical inputs from members of our Steering Committee and working groups and the Foundation, seven pilot sites/organizations were selected with three in the alpha pilot round and four for the Beta pilot. In order to maximize testing and refinement of the Blueprint, the first set of pilots was focused on the elements of the framework that test variables most closely associated with demographics, assessments, and education technology. We prioritized pilots who 1) have an active research question that aligns with the three priority areas above, 2) have capacity or expertise in the areas of data science, and 3) have a clearly defined research question that can be answered without physical observation. Pilots are anchored either with a local education agency (LEA) or an intermediary organization whose research work spans a network of LEAs. Taking the network approach would begin to create datasets aligned with rapid-cycle evaluation.

To determine the use case, build a broad base of support for adoptability of the Blueprint, and act in accordance with the criteria mentioned above, the following organizations were identified for the pilots:

1. Alpha Pilot

- a. Practitioner (school district): Great Oaks Charter School
- b. EdTech Provider (evaluation & analysis): LearnPlatform
- c. Practitioner & Research Intermediary: Transcend Education

2. Beta Pilot

- a. Researcher: Mathematica
- b. EdTech Provider (Instruction): Saga Education
- c. EdTech Provider (Student Information System): Infinite Campus
- d. Research-Practice Partnership: National Network of Education Research-Practice Partnerships (NNERPP)

Appendix A provides information on each of the organizations and their role in the education community.

Methodology

The Blueprint was designed through a combination of stakeholder engagement and a rigorous methodology developed and vetted by experts. The guiding principles developed by the Steering Committee and Working Groups led to the creation of a methodology that included high-quality and extensive landscape analysis to understand existing research, standards, and publicly available databases. The design methodology involved understanding application and impact, as well as building a credible evidence-based foundation for the creation of the Blueprint. This process underwent rigorous due diligence and pressure testing through user-informed pilots to understand the applicability and generalizability of the Blueprint across multiple stakeholder groups. The design methodology and stakeholder review culminated in the creation of the Core and Advanced Blueprint, which is composed of critical data elements for intervention-based research and evaluation.

The evaluation process entailed two distinct approaches:

1. **Approach 1:** Assess the applicability and coverage of the Blueprint by cross-mapping the modules and submodules against the established evaluation framework of different pilot partners.
2. **Approach 2:** Instrument 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 following tables show the approaches chosen by the pilot sites.

Table 1. Organizations that underwent pilot approach 1

Approach 1			
Participation	Name	Type of Organization	Focus within Blueprint
Alpha Pilot	LearnPlatform	EdTech (Evaluation)	Population, assessment, and EdTech
Alpha Pilot	Transcend Education	Research-practice intermediary	Population, and social-emotional learning

Beta Pilot	Infinite Campus	EdTech (SIS)	Full Blueprint with focus on behavior and engagement
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Table 2. Organizations that underwent pilot approach 2

Approach 2			
Participation	Name	Type of Organization	Focus within Blueprint
Alpha Pilot	Transcend Education	Research-practice intermediary	Population, and social-emotional learning
Alpha Pilot	Great Oaks Charter School	School	Population, teacher evaluation, courses, and assessment
Beta Pilot	Saga Education	Tutoring organization	EdTech, implementation, and program cost
Beta Pilot	Mathematica	Evaluation organization	Population, intervention, and outcomes

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

1. **Coverage:** The coverage is defined as the total 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. Examples of some of the main pilot questions were: Does the framework cover elements aligned to the pilot’s research question or does it help the pilot organization to articulate data needs under their specific research questions? The criteria for success were set at 50% or more elements mapped in different modules.
2. **Understandability:** Understandability is defined as the assessment of clarity in definitions and understanding of the elements by other stakeholders. The precision, organization, and ambiguity were assessed using qualitative and quantitative data. Examples of some of the main pilot questions were: Is the pilot able to understand data elements and their applicability to their design of research questions? Is the pilot site able to articulate its data needs through the framework to

3rd parties or other evaluation agencies such as a research intermediary, or a research-practice partnership, or to a digital learning provider? Is there an alignment between concept organization and user conceptualization? How easily is the framework able to connect to the real experience of data collection and analysis? The criteria for success were set at 50% or more definitions of the elements that match with partner organizations.

- 3. Generalizability:** Generalizability is defined as the extent to which the elements, modules, and sub-modules are aligned to real-world applications 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. Examples of some of the main pilot questions were: Are the pilot sites able to design a research question across multiple domains of education? Are the pilot sites able to embed the framework in the current research framework to improve the efficiency of doing research? Is the framework primed and positioned for wider sector applicability? The criteria for success were set at 50% or more on the median across different pilot studies on coverage metrics.

The anticipated long-term success outcomes are two-pronged:

1. There will be greater efficiency and effectiveness demonstrated through cost reduction to run research studies, increased school engagement with research, enhanced shareability of study results, and improved user engagement in the R&D process.
2. There will be sector-wide replicability and scalability of a framework for different types of research needs of practitioners and other stakeholders.

In addition, many of the organizations were in varying degrees of developing their own evaluation frameworks, which helped test the viability of effectiveness of the Blueprint. For example, the Blueprint was mapped against LearnPlatform's new intervention-based research evaluation form called the Universal Evidence Report (UER). The Blueprint and the UER can work together to create more accessible research, and this pilot was necessary to understand exactly how this can be done. Conversely, Saga Education is a newer organization and does not have a developed schema for research evaluation, so the pilot helped understand if the Blueprint can be adopted by the organization for their research needs. Infinite Campus mapped its entire student information system against the Blueprint, which highlighted gaps and limitations of both the SIS and the Blueprint. As Mathematica is a research organization, it was critical to understand the needs of researchers and how the Blueprint can assist and facilitate the research process.

Engagement approach and implementation

A detailed engagement process was developed and implemented for the pilot in two phases. The process entailed five stages: onboarding, design, implementation, evaluation, and feedback. The stages and their associated functions are demonstrated below:

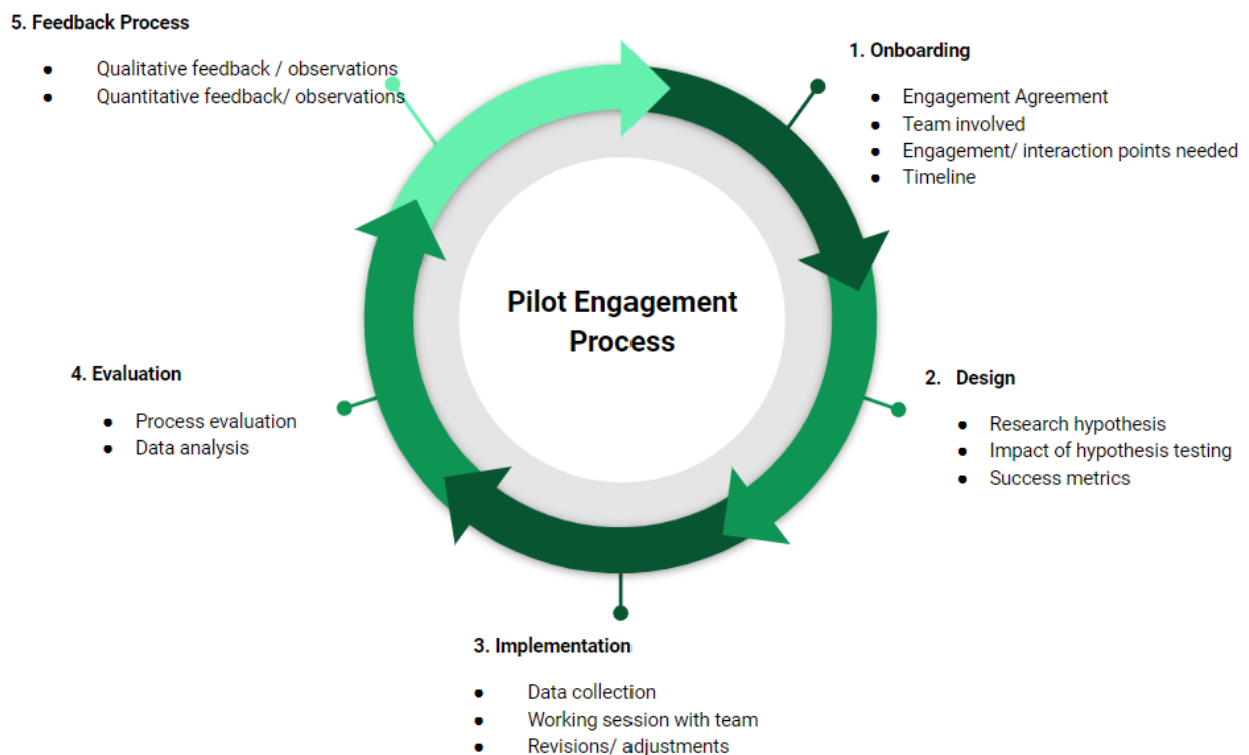


Figure 1. Pilot engagement process overview

Each pilot had a different timeline for implementation and ranged from four to eight weeks depending on the complexity of the engagement, data access and collection needed, and design workshops needed to come to a wide consensus. However, for each set of pilots, the process was completed in the five steps outlined above.

During the onboarding, the pilot site and InnovateEDU lay out the terms of engagement and determine the team members who will be involved. The timeline of the pilot was mapped out, as well as the specific interaction needed by both teams throughout the duration of the pilot. Specific memorandum of understanding and data sharing agreements were signed by the respective team members and

executives of the organizations. For the design phase of the pilot, the pilot partner and InnovateEDU outlined what exactly will be tested and analyzed - whether evaluation and integration of the Blueprint in the existing framework (approach 1) or a well-formulated research question (approach 2).

The implementation phase differed in the timeline or in complexity based on what approach was used by the pilot sites. If the design focused on approach 1, the data collection and design workshop with the team in the implementation focused on understanding the existing evaluation framework and its aspects to truly understand its applicability, what specific interactions between different stakeholders existed as well as the gaps that existed in the application of the framework. If approach 2 was used, the design workshop included instrumenting a research question based on the experience and priorities of the pilot sites and articulating an understanding of data needs by the pilot sites. Based on the initial implementation and with interactive feedback loops from weekly standing meetings and discussions, revisions and adjustments were made to the pilot evaluation process.

The evaluation stage focused on the process evaluation of the pilot and the analysis of data collected. The process evaluation was conducted through qualitative and quantitative measures. A thorough qualitative interview was conducted with the pilot partners to understand the challenges in the application, integration, and generalizability of different types of research questions.

Lastly, the feedback process entailed conducting a final exit interview with all designated team members of the pilot sites to get qualitative and quantitative feedback and observations. The meeting also included reviewing the final findings and results of the pilot and assessing how well the Blueprint performed against the success criteria of coverage, understandability, and generalizability.

To facilitate this process further for the pilot partners, a detailed toolkit was developed step by step to support the implementation of the pilot sites' chosen approach. A snapshot of the pilot process is highlighted in the box below.

Appendix B shows the different templates completed by the pilots for compilation and codification of the pilot.

- A. Introduction:** Please complete Section A of the **Alpha Pilot Assessment and Reflection** template.
 - B. Design research question:** Please use the **PICO Elements and Question Template** to design your own PICO style research question.

C. Blueprint assessment

a. Modules & element identification

Based on the PICO style question already formed in the first part of the process, what modules and elements (up to 10 categories and 10 elements) need to be collected to create a robust evaluation design and comprehensive data collection?

Please use the **Module and Element Identification Template** to codify your data needs. Please answer **Section B** of the **Pilot Assessment and Reflection** template.

b. Modules & element mapping

Next step is to cross-map the modules and elements that you have identified to the nodes of the concept data Blueprint. Please use the **Final Blueprint Module & Elements Mapping Template** to cross-map the categories with the **Blueprint**.

During this process, please answer **Section C** of the **Pilot Assessment and Reflection** template to think aloud and explain your decisions.

D. Modeling structure: This section evaluates the structural correctness of the model and Blueprint through a series of questions that assesses the relationship among the modules as well as relatedness of the relationship between the modules and elements within those areas. For each set of relationships, please answer **Section D** of the **Pilot Assessment and Reflection** template.

Appendix C demonstrates an example of what the pilot engagement looked like for one of the pilot sites (Transcend Education).

Findings and recommendations

Key metrics were calculated for each of the pilot sites based on the approach that was chosen. Key indicators included coverage and understandability scores. Generalizability scores for each of the pilots were calculated based on the coverage scores. Based on Alpha pilot scores, the generalizability scores of the entire Blueprint were at 62%. This was further enhanced to 77% based on the coverage and understandability scores of the beta pilot sites. The table below provides a summary of the profile of the pilot partners, the educational module they decided to test, and the approach the pilots adopted in the pilot. It also provides findings on the element coverage metrics across multiple modules as well as overall generalizability score based on the results.

Table 3. Coverage and generalizability indicators

Pilot Partners	Education modules & sub-modules	Element coverage
1. Research Intermediary	Social-emotional learning and culture	74%
2. EdTech platforms	EdTech, assessments, and demographics	94%
3. School district	Teacher evaluation, assessments, and demographics	43%
4. Student Information system - EdTech	Demographics, family and community, and outcomes	80%
5. Student tutoring system - EdTech	EdTech, population, and program cost	58%
6. Research & evaluation organizations	EdTech, intervention, demographics, and outcomes	88%
Overall generalizability score* - 77%		

**Generalizability score is the median of element coverage score*

Key observations and improvements or revisions needed in the Blueprint were captured from the alpha and beta pilot sites and are included below:

Observations

- There is high coverage of population and academic outcomes elements.
- There was a high coverage of many domains in the Blueprint, including:
 - Demographics;
 - Stakeholder type, particularly school/student/staff and community elements;
 - Assessments, as it relates to standardized growth and summative assessments; and
 - Social-emotional learning elements.
- Defining an “understandability” score is challenging, compared to the healthcare sector.
- Not all elements are covered with high fidelity within each module.
- The generalizability threshold needs to be defined from the literature review.

Improvements / Revisions

- There is a need for deeper due diligence on modules that include teacher evaluation and social-emotional learning.
- Modules related to student-learner experiences are critical and should be included in the Blueprint.
- Modules and elements related to continuous improvement need to be included in the Blueprint.
- The preliminary gaps, or elements that the Blueprint does not contain, included:
 - Teacher evaluation;
 - Non-academic outcome indicators, including qualitative non-academic outcome elements; and
 - Assessments, as it relates to competency/mastery-based assessments.

The summary of learnings and recommendations were presented to the members of the Steering Committee and the Working Groups to provide feedback and guidance on the development of the Blueprint. The pilot profile section illustrated next provides detailed information on the data analysis and evaluation specific to each pilot site.

Pilot Profiles

Pilot Profile #1: LearnPlatform

Pilot Title: Integration of Universal Evidence Reports (UER) and the Blueprint to create more accessible and inclusive research

Pilot Summary:

LearnPlatform has a collection of historical Rapid Cycle Evaluations (RCEs) on different products and interventions to understand their impact. RCEs results drive the creation of universal evidence reports (UERs), an open-source form to document education evaluation information. The pilot design focused on utilizing the collection of RCEs and its summary variables to understand the complementary overlap of these variables with Blueprint elements. The process assessed mapping and coverage of modules such as population, assessment, and education technology characteristics. The pilot demonstrated more than 90% coverage and 88% understandability score across the identified elements. This pilot demonstrated the use case for the education technology organizations in the sector and emphasized how alignment with the Blueprint can improve EdTech tool data models to serve the practical data and research needs of both practitioners and researchers.

Overview

LearnPlatform builds ground-breaking tools to expand equitable access for all students, by increasing the capacity of educators and their organizations to select and evaluate digital learning products that best meet the needs of their students. LearnPlatform collects data from thousands of EdTech products across the country, then provides analysis and organizes data for millions of students, as well as streamlines processes such as procurement, piloting and evaluation.

Learn Platform creates Universal Evidence Reports (UER), from the results of Rapid Cycle Evaluations (RCEs) conducted. UERs provide consistent, peer-vetted, open-source forms for the reporting of evaluations of education interventions. It focuses on settings in which interventions occur, methods and samples in which evaluations occur, and findings that are consistent and shareable. LearnPlatform is building a data archive of UERs to be made available publicly for wider, open-source research and inquiry.

The BIRD-E Blueprint is a free, open-source framework that aims to modernize education research through a common, research-based 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 the design, collection, and reporting of research to answer the most pressing question of what works, for whom, and under what conditions. It contains a list of critical data elements that summarizes and represents key education data needs in the K-12 spectrum including early childhood.

Pilot Approach and Evaluation

LearnPlatform has a collection of historical Rapid Cycle Evaluations (RCEs) on different products and interventions to understand their impact. The pilot design focused on utilizing the collection of RCEs and its summary variables to understand the complementary overlap of these variables with Blueprint elements. As part of the pilot design and process, LearnPlatform’s UER evaluation framework was assessed and mapped against the Blueprint to assess coverage and comprehensiveness.

In the comparison of the UERs and the Blueprint, both teams focused on observing the overlaps, particularly with demographics, assessment, and education technology elements. This pilot demonstrated the use case for the education technology organizations in the sector and emphasized how alignment with the Blueprint can improve EdTech data models to serve the practical data and research needs of both practitioners and researchers.

Findings & Recommendations

LearnPlatform identified 543 RCEs to use for the pilot. Of the 543 RCEs, 32 total elements were identified that were most frequently used by LearnPlatform partners for analysis. The pilot demonstrated a 94% coverage and 88% understandability score. 94% of UER variables have a match with the Blueprint. 88% of UER variables have the same definitions as the Blueprint elements they were matched with.

Gaps between RCEs and the Blueprint included local education agency (LEA) and district size, which are not included as elements in the Blueprint but emerge as one of the key variables in RCEs. The definitions of the pre-achievement metrics were improved in the Blueprint as per the recommendation of LearnPlatform’s feedback.

Pilot Profile #2: Mathematica

Pilot Title: Using the Blueprint to understand the effectiveness of automated essay scoring interventions

Pilot Summary:

Mathematica partners with Bill & Melinda Gates Foundation grantees in many different programmatic areas. This pilot focused on the evaluation of automated essay scoring tools from a variety of grantees designed to create more opportunities for students to practice writing. The pilot tested the Blueprint against a set of research questions from the current cohort of grantees using the essay scoring tools. An exhaustive list of elements was identified from the current research plans of the grantees in a collaborative engagement. The pilot demonstrated a high coverage of 88% across the current evaluation plans. This highlights the ability of the Blueprint to act as a translational layer between researchers and practitioners, as well as substantiates the researchers' use case.

Overview

Mathematica illuminates the path to progress for public- and private-sector changemakers. Mathematica operates at the intersection of data, methods, policy, and practice, with the mission to improve public well-being. It supports its partners to make evidence-based decisions and using evidence to guide practice in a variety of sectors, including education, healthcare, child welfare, and family support. They work alongside their partners to tackle social challenges in real-time.

Mathematica grantees design and conduct research to inform program improvements, and to measure program costs and the extent to which the programs improve outcomes for students. Mathematica has partnered with grantees in a few different programmatic areas, including automated essay scoring tools designed to create more opportunities for students to practice writing.

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Pilot Approach and Evaluation

Mathematica partners with grantees in a few different programmatic areas, but the pilot focused on the evaluation of automated essay scoring tools designed to create more opportunities for students to practice writing. The pilot tested the Blueprint against a set of research questions from the current cohort of grantees using the essay scoring tools.

Mathematica and BIRD-E examined the questions across the grantees and consolidated them into four common research questions. An exhaustive list of elements was identified from the current research plans of the grantees in a collaborative engagement. 57 elements were found across the evaluation plans to conduct the mapping process.

This highlighted the ability of the Blueprint to act as a translational layer between researchers and practitioners and substantiated the researchers' use case. By making research inputs and outcomes more comparable, Mathematica would be better positioned to understand their grantees' impact and what works for students.

Findings and Recommendations

All 57 elements were mapped to the Blueprint, though not all elements had a unique match. This was primarily due to identified elements from the evaluation plans having broad definitions which led to the aggregation of these elements into a few elements in the Blueprint. Elements that were more difficult to match were those specific to writing, like student argumentative writing proficiency and essay revisions. Despite the bespoke and narrow nature of these elements, it was matched with the elements in the Blueprint.

Overall coverage for this pilot was 88%, with 50 Blueprint elements mapped to the 57 compiled Mathematica elements. Qualitative methods were used to calculate understandability, with an understandability score of 62.16%.

Pilot Profile #3: Transcend Education

Pilot Title: Evaluating the Whole Child Model of school culture using the Blueprint

Pilot Summary:

Transcend Education, in collaboration with Van Ness Elementary School, implemented the Whole Child Model that focuses on providing a set of school-wide practices that create a safe, connected environment for children and adults. At the intermediary level, the research team cross-mapped the existing evaluation framework being used against the Blueprint to assess coverage and applicability. It used the Blueprint to validate a well-defined research hypothesis around school culture and mindset. Additionally, it identified elements needed to answer the research question and conduct analysis. The pilot demonstrates an effective use case for practitioners and its value as a translational layer between practitioners, researchers, and solution providers.

Overview

Transcend Education plays a key partnership role to fuel and grow R&D capacity. Given the day-to-day demands of school, visionary educators are often held back in the innovation they can pursue. Transcend believes they will make the best progress when afforded the time, capacity, and support to not only imagine and design but also build, prototype, assess, iterate upon, codify, and ultimately replicate breakthrough new models. Through partnering with school operators, Transcend aims to play a vital role in affording visionary educators – and the sector more broadly – the deep R&D capacity needed to accelerate breakthroughs in the creation and spread of new “school” models.

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Pilot Approach and Evaluation

Transcend Education, in collaboration with Van Ness Elementary School, implemented the Whole Child Model that focuses on providing a set of school-wide practices that create a safe, connected

environment for children and adults. Transcend Education was designing a research study to understand the impact of this model. For the pilot, at the intermediary level, the research team cross-mapped the existing evaluation framework and is currently used to collect data against the newly formed Blueprint to assess the coverage and applicability of their evaluation framework.

Transcend used the Blueprint to validate a well-defined research hypothesis around school culture and mindset, especially from the Whole Child Model using the Population, Intervention, Comparison, Outcome (PICO) framework. It used the Blueprint to identify variables that will be needed to answer the research question and to conduct an analysis on a subset of schools that implement the Whole Child Model with technical assistance from Transcend Education. The major modules identified by the research team included student/population characteristics, identification & implementation elements, academic & non-academic outcome indicators, as well as social-emotional competencies.

The pilot demonstrated an effective use case for the practitioners on the design of a well-defined research hypothesis and the use of the Blueprint to articulate and identify the data needs to internal and external stakeholders for effective research evaluation. It also highlights the value of Blueprint as a translational layer between practitioners, researchers, and solution providers.

Findings and Recommendations

85 elements were identified for the process of this evaluation. This was specifically carried out to assess coverage and whether the Blueprint had all the elements needed for the evaluation to answer the research question. A total of 52% coverage was found between the initial elements identified and the elements that would eventually be needed for evaluation.

Pilot recommendations included adding an element related to free reduced-price lunch (FRPL) in the school memberships sub-module, and adding modules or sub-modules related to continuous learning and improvement and learner experiences.

Transcend's repository contains many elements related to school model design; these elements were used as a basis to include personalized learning elements into the Blueprint. The pilot proved the strength of the population module of the Blueprint. Transcend concurred they can add more population elements in their repository based on those included in the Blueprint.

Pilot Profile #4: Infinite Campus

Pilot Title: Insights and learnings from mapping a student information system to the Blueprint

Pilot Summary:

The focus of the pilot was to map the full Blueprint against the entire student information system of Infinite Campus. Special emphasis was given to see how the Infinite Campus's student information system mapped against the Blueprint in the behavior and student engagement submodules. The Blueprint had more than 80% coverage of all elements. The highest element coverage areas were: population, outcomes, family, and community. The Blueprint demonstrated 83% coverage in behavior and student engagement submodules against the student information system.

Overview

Infinite Campus is a comprehensive, web-based K-12 student information system (SIS) with real-time access to administration, instruction, communication, curriculum, reporting, and more. Infinite Campus aims to transform K-12 education by streamlining educational processes, promoting stakeholder collaboration, and personalizing learning. Infinite Campus conducts research both internally (e.g. for products like their machine-learned school dropout early warning system) and externally, with researchers who want to directly or indirectly work with Infinite Campus' customers.

Infinite Campus believes that excellence in education data management and practitioner software workflows are crucial to bringing key insights into the classroom. To increase their impact, Infinite Campus is building a reusable research infrastructure to serve a variety of researcher stakeholders in a variety of organizations.

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Pilot Approach and Evaluation

Infinite Campus shares goals with BIRD-E in modernizing education research and delivering efficiencies like formulating more effective research questions and having a greater representation of education agencies. In 2021, Infinite Campus and BIRD-E partnered to understand how a student information system maps against the Blueprint.

The focus of the pilot was to map the Blueprint against the entire student information system of Infinite Campus. This essentially meant a review of the full Blueprint across all modules and submodules and their respective elements. Special emphasis was given to see how the Infinite Campus's student information system mapped against the Blueprint in the Behavior and Student Engagement submodules.

In preliminary discussions, Infinite Campus indicated that their SIS has many domains that would and would not map well to the Blueprint. Domains that would map well included population characteristics, non-SEL outcome variables, and academic records. Domains that would not map well to the Blueprint included technology, school model, and social-emotional learning modules. This limitation is primarily driven by the lack of data collection by the districts. Driven by the market demand, organizations such as Infinite Campus do have to cater to their customers and district partners.

The mapping process was relatively straightforward. Infinite Campus examined all elements of the Blueprint and indicated 'yes,' if the Blueprint element is collected in their SIS, 'no,' if the Blueprint element is not collected in their SIS, and 'unknown,' if the Blueprint element is not clearly defined or identified in their SIS. Within the 'unknown' elements, eight elements, or 18% of the total 'unknown' elements could be potential 'yes'; the definitions do not entirely match up or they might be stated differently in the SIS.

Findings and Recommendations

The modules in the SIS with the most coverage in the Blueprint were population, outcomes, and family and community with a coverage score of 80%. 10 out of 12 elements in the behavior sub-module were mapped to Infinite Campus' SIS, with an 83% coverage. One of the main recommendations from the Infinite Campus research team was to have clear consistent definitions for elements to eliminate the different interpretations from different stakeholders.

There was strong evidence of how the Blueprint can act as a facilitator for the cross-collaboration between districts and EdTech organizations and will help achieve improved data collection in a standardized format. This pilot demonstrated the use case for education technology organizations in the

sector and emphasized how alignment with the Blueprint can improve EdTech data models to serve the practical data and research needs of practitioners and researchers.

Pilot Profile #5: Saga Education

Pilot Title: How usage of the Blueprint can impact program cost reduction and student engagement

Pilot Summary:

Saga Education is a non-profit organization focused on fostering the power of tutoring relationships to maximize students' full potential. This pilot focused on the evaluation of cost reduction and student engagement of a program. A set of research questions was created and a list of elements were identified from given grantee evaluation plans to test against the Blueprint. The pilot demonstrated a coverage of 58%, with an understandability score of 91%.

Overview

Saga Education is a non-profit organization focused on fostering the power of tutoring relationships to maximize students' full potential. They partner with six districts across the nation to provide direct math tutoring services, and also provide technical assistance, intensive training, and quality assurance, plus access to an online tutoring platform, a tutor training portal, and a math tutoring curriculum, to state and local education agencies.

Both the Saga and BIRD-E teams thought that testing how the Blueprint could answer current research questions would not only convey how effective the Blueprint currently is, but also to see the potentiality of a newer organization like Saga adopting the Blueprint to facilitate their research needs. Research and evaluation is critical to both Saga's internal evaluation of their impact and continuous improvement efforts, and Saga's fundraising and grant acquisition efforts.

The Blueprint is a free, open-source framework that aims to modernize education research through a common, research-based 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 the design, collection, and reporting of research to answer the most pressing question of what works, for whom, and under what conditions. It contains a list of critical data elements that summarizes and represents key education data needs in the K-12 spectrum including early childhood.

Pilot Approach and Evaluation

The domains of focus for this pilot, cost reduction and student engagement, were chosen due to mutual benefits for each team: previous pilots had not pressure tested these domains, and these were two areas that Saga was trying to improve. The research questions focused on a platform called Saga Learn, which is a tool not currently in use, but in development.

BIRD-E closely evaluated the given evaluation plans and pulled 70 elements / variables related to cost, student engagement, and the general relevance of the research questions. After Saga's initial analysis, six elements were excluded and deemed to be repeat and/or irrelevant elements and variables, bringing the total element count to 64 elements.

Findings and Recommendations

All 64 elements were mapped to the Blueprint, though not all elements had a unique match. Many Saga elements did not have an attached definition or descriptor outlined in the evaluation plans, but the Saga element names were detailed enough to clearly fit Blueprint element definitions.

The overall coverage of elements mapped was 57.81%, as 37 Blueprint elements were mapped to 64 Saga elements. Elements related to ratings were also hard to match, as there are no Blueprint elements that explicitly state 'ratings,' but rather feedback mechanisms and student reflection/evaluation instead.

As this pilot was focusing on cost reduction and student engagement, it was validating that most of the mapped elements came from the Intervention module. 18/45 or 40% of elements within this module were mapped within Intervention cost. All the Saga elements mapped to the sub-module of Implementation Results were related to ratings and enjoyment of math. Qualitative methods were used to calculate understandability, with an understandability score of 90.91%.

Pilot Profile #6: Great Oaks Charter School

Pilot Title: Using the Blueprint to examine teacher evaluations based on student assessment data

Pilot Summary:

Great Oaks Charter School District is based in NYC with the mission to provide their students with a rigorous curriculum in a nurturing environment. 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 to identify targeted coaching interventions for their staff. 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.

Overview

Great Oaks Charter School District is based in NYC with the mission to provide its students with a rigorous curriculum in a nurturing environment. Their guiding principles of Mastery, Leadership, and Community ensure the support of all of their students in becoming compassionate leaders.

Great Oaks Charter Schools administers coaching and professional development services to teachers based on their teacher 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 to identify targeted coaching interventions for their staff.

The Blueprint is a free, open-source framework that aims to modernize education research through a common, research-based 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 the design, collection, and reporting of research to answer the most pressing question of what works, for whom, and under what conditions. It contains a list of critical data elements that summarizes and represents key education data needs in the K-12 spectrum including early childhood.

Pilot Approach and Evaluation

Great Oaks Charter Schools strives to have continuous improvement in teaching and learning, so teacher evaluation was determined to 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 from their ODS dashboard system to pull student identifier elements. 52 relevant elements were found in total from the TeachBoost rubric and NWEA assessment.

Findings and Recommendations

All 52 elements were mapped to the Blueprint. 23 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: the 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 teacher evaluation and determine coaching implementation.

Pilot Profile #7: National Network of Education Research Practice Partnerships (NNERPP)

The pilot process with the National Network of Education Research Practice Partnership (NNERPP) was conducted through a different approach than what has been explained in the engagement approach above. The NNERPP is a consortium of researchers, district research teams, and research practice partnerships. The pilot engagement was designed to solicit direct feedback on the documentation and codification of the Blueprint, its elements, and definition from the NNERPP members. A solicitation was made among all the members to participate in the survey-based feedback process in this pilot. Five organizations and their members volunteered to participate in the feedback process. These organizations were:

- 1. Digital Promise**
- 2. Marzano Research**
- 3. Research for Action**
- 4. San Francisco Unified School District**
- 5. Illinois Workforce and Education Research Collaborative**

These members received a survey to provide feedback on the relevance of the elements selected in the Blueprint, the comprehensiveness of their definitions, and were requested to provide information on the gaps or missing elements in the Blueprint. Appendix D highlights the template used to receive feedback from the NNERPP members. Some of the main recommendations made by the NNERPP members were as follows:

- 1.** School climate and culture indicators must include perceptions of school culture. The perceptions should singularly reflect administrators, teachers, and students separately.
- 2.** Staff identifiers and staff credentialing and assessment elements should be more clearly delineated with a clear classification code for understanding.
- 3.** The sub-modules under the Intervention module should follow a specific order and must include costs as it provides a unique value add to assess the correlation between type and focus of the intervention.
- 4.** Personalized learning elements should be incorporated into the enabling conditions under interventions and should not be a separate sub-module.
- 5.** Definition for gender is actually for sex (the concept describing the biological traits that distinguish the males and females of a species). Gender is a social construct of characteristics (e.g. woman, man, non-binary, other). Such distinction should be highlighted in the Blueprint.
- 6.** Under student identifiers, student transfer codes should be clearly denoted such as active status vs. leave code vs. withdrawn status. Also, the home language / dominant language should be

coded.

7. ELL/LEP start date, date of eligibility for EL services, ELL/LEP reclassification date, and date of reclassification from EL to RFEP should be classified and codified.
8. Social-emotional learning (SEL): There is a lack of established, sufficient construct and discriminant validity on the dimensions of SEL to warrant including them in a standard data framework.

All these recommendations were incorporated into the Blueprint after careful consideration and review by the members of the Steering Committee and Working Groups.

Appendix

Appendix A

1. LearnPlatform

LearnPlatform builds ground-breaking tools to expand equitable access for all students, by increasing the capacity of educators and their organizations to select and evaluate digital learning products that best meet the needs of their students. LearnPlatform collects data from thousands of EdTech products across the country. With this data, they provide analysis and organize data for millions of students, as well as streamline processes such as procurement, piloting, and evaluation.

2. Mathematica

Mathematica is a research organization that uses data and policy to drive global research advancements. They partner with federal agencies, state and local governments, foundations, businesses, universities, and professional associations across the country and around the globe. Its mission is to improve public well-being by collaborating closely with its partners and grantees to improve programs, refine strategies, and enhance understanding.

3. Transcend Education

Transcend believes that all children have infinite potential, and schooling needs to be reimagined as we know it to create extraordinary and equitable learning environments. Transcend equips communities to be responsive to the demands and needs of the 21st century. Transcend's core values that guide how they work include results for kids, diverse voices, play big, perpetual beta, long-term, and love.

4. Infinite Campus

Infinite Campus aims to transform K-12 education by streamlining educational processes, promoting stakeholder collaboration, and personalizing learning. Infinite Campus conducts research both internally (e.g. for products like their machine-learned school dropout early warning system) and externally, with researchers who want to directly or indirectly work with Infinite Campus' customers.

5. Saga Education

Saga Education is a non-profit organization focused on fostering the power of tutoring relationships to maximize students' full potential. Saga aims to nurture students and provide them with positive and meaningful relationships to be partners in their educational journey. They partner with 6 districts across the nation to provide direct math tutoring services and also

provide technical assistance, intensive training, and quality assurance, plus access to an online tutoring platform, a tutor training portal, and a math tutoring curriculum, to state and local education agencies.

6. Great Oaks Charter School

Great Oaks Charter School District is based in NYC with the mission to provide their students with a rigorous curriculum in a nurturing environment. Their guiding principles of Mastery, Leadership, and Community ensure the support of all of their students in becoming compassionate leaders. Great Oaks Charter School is committed to providing unparalleled individualized instruction, a commitment to family and community engagement, and high expectations for success in college and beyond.

7. National Network of Education Research-Practice Partnerships (NNERPP)

The National Network of Education Research-Practice Partnerships, or NNERPP, is a collective aimed at developing and supporting partnerships between education agencies and research institutions in order to improve the relationships between research, policy, and practice. They help partnerships to develop and share best practices, synthesize research findings, and produce comparative research.

Appendix B

Template 1: Pilot Assessment and Reflection Template

Section A: Introduction

1. What is your role in the organization and why is it important for you to have a good research and evaluation process in your organization?
2. For how many years have you been conducting research/ analysis?
3. How often do you or your team analyze data and to what end in a given academic year?

Section B: Module and Element Mapping Identification

1. While creating the list of modules and elements, what were the decision criteria to choose these modules and elements? Describe the modules and elements that were hardest to identify and articulate?
2. Are all the elements easy to collect from the data systems? If not, which ones do you think are most challenging to collect and why?

Section C: Modules and Element Mapping

After the element mapping, please answer the set of the follow-up questions to gather additional information.

1. PICO-focused research questions:
 - a. Would you add any additional / missing modules that would better articulate your data needs?
 - b. Would you add any additional elements to the concept data Blueprint?
2. General Blueprint questions
 - a. From your experience doing research with education data, what other data needs are we missing?
 - i. Additional modules and sub-modules?
 - ii. Any granular elements within the modules?

Section D: Modeling Structure

For each set of relationships, please answer the following questions:

1. PICO-related module-elements relationships
 - a. How do you interpret the relationship between the modules and sub-modules?
 - b. Is the relationship (a) interesting (b) uninteresting or (c) I don't know
 - c. If it's interesting, please describe the relationship.
 - d. Within each module, answer the following questions
 - i. Identify the ambiguous module-element relationships?
 - ii. How would you structure them otherwise?

2. General module-elements relationships
 - a. Are there other modules-elements of interest or expertise that you would like to reflect about and answer the same above questions?
 - b. How do you interpret the relationship between the modules and sub-modules?
 - c. Is the relationship (a) interesting (b) uninteresting or (c) I don't know
 - d. If it's interesting, please describe the relationship.
 - e. Within each module, we ask the following questions
 - i. Identify the ambiguous module-element relationships?
 - ii. How would you structure them otherwise?

Template 2: PICO Elements and Question Template

PICO is a widely-used acronym to assist in remembering the key components of a clinical question. There are additional letters and frameworks to help you formulate a question fitting your research. Not all parts of PICO are required! PICO is a framework to help you narrow your topic, not a rule.

When should you use PICO?

- In academia when you are looking for evidence to support best practice
- In practice when you have a question about patient care or the effect of an intervention

Why should you use PICO?

- Helps you form a focused question that will return relevant results
- Helps you retrieve a manageable amount of results
- Assists you in brainstorming keywords for your research
- Saves time!

Below are some of the most critical elements of designing a PICO framework. Please review the terminologies for understanding the elements for consideration in designing your research question.

Design your own PICO-inspired research question using the template below. You do not have to use all elements. Identify and choose the most critical elements that would help in designing the most precise research question.

Question Formulation Framework	Elements	Description / questions to consider
Population	P	Most important characteristics Relevant demographic factors
Sample	S	Group of people/ students being studied?
Perspective	P	Users, potential users, or stakeholders of the service (for whom).
Expectation	E	What are you looking to improve or change? What is the information going to be used for?
Location	L	What is the service or policy located?
Context	Co	Important characteristics that demonstrates success or failure of an interventions Seeking to analyze human experience and social phenomena
Intervention or topic of interest	I	Intervention is the action taken for the users, potential users, or stakeholders (what), example: main intervention, treatment, diagnostic assessment, procedure, or exposure, dosage, frequency, duration, and mode of delivery
Exposure or topic of interest	E	What is the issue I am interested in?
Phenomena of interest	P of I	What are the reasons for behavior and decisions?
Service	S	What kind of service is this?
Design	D	How is the data collected? (surveys, interviews..)
Research Type	R	What type of research method (qualitative or quantitative)

Comparison	C	Comparison is the alternative actions or outcomes (compared to what) (business as usual, peer group with no intervention, absence of an environmental or pedagogical factor, peer group or no intervention) Example: Inactive control intervention: Placebo, standard care, no treatment Active control intervention: A different drug, dose, or kind of therapy
Outcome	O	What, in relation to the issue, do I want to examine subjective or objective specific and make it measurable
Evaluation	E	Evaluation is the result or measurement that will determine the success of the intervention (what is the result, how well) What is the outcome being impacted?
Setting	S	Setting is the context for the question (where).
Time Frame / Duration	T/ D	time it takes to demonstrate effect Duration a period over which outcomes are assessed
Type of Study	TS	Indicating which study designs, such as randomized controlled trial [RCT] or diagnostic study
Digital Data	D	allowing for the explicit identification of data measures that form the basis of the evaluation of an intervention.

Research Question Template

Question Formulation Framework	Description	Additional information (Optional)

Final Research Question: Please ensure that it has at least Population, Intervention, Comparison and Outcome identified?

Appendix C

Engagement Process: Approach 1

Week	Phase	Objective	InnovateEDU will..	Pilot site will...	Tools	Meeting
1	Onboarding	Understand main objective, expectations, success metrics	<ul style="list-style-type: none"> Send MOU Send pilot deck with full details on pilot focus, expectations and success criteria 	<ul style="list-style-type: none"> Review MOU and sign Sign data sharing agreement if applicable Discuss and clarify success metrics and expectations 	MOU Slide deck	45 min
2	Design Session*	Designing key elements and implementation plan	<ul style="list-style-type: none"> Provide contextual information and overview of the data schema versions 	<ul style="list-style-type: none"> Provide contextual information about the pilot, overview of the project etc. 	Slide decks	60 mins
3	Implementation workshop (#1)	Schema incorporation into Transcend Framework	<ul style="list-style-type: none"> Provide support to Transcend in incorporating schema into their framework and model 	<ul style="list-style-type: none"> Collaborate with InnovateEDU to identify specific categories and elements within them for integrations in the model Specify reasons for such action Design process & ways to integrate schema into their framework 	Observation tool	60-90 mins
4	Implementation workshop (#1) / Evaluation		<ul style="list-style-type: none"> Provide support to Transcend in incorporating schema into their framework and model (Final Version) 	<ul style="list-style-type: none"> Finalizing the integrations into the model Reflecting on the process of integration Reflecting on specific success metrics of understandability, ease of use and coverage 	Reflection tool	60 mins
5	Feedback process	Reflection on process and providing feedback	<ul style="list-style-type: none"> Provide a reflection tool for pilot sites to codify their feedback 	<ul style="list-style-type: none"> Provide feedback on process of conducting alpha pilot, add elements in schema for integration and other inputs 	Reflection tool Exit survey	Asynchronous & 30 mins 1:1

Engagement Process: Approach 2

Week	Phase	Objective	InnovateEDU will..	Pilot site will...	Tools	Meeting
1	Onboarding	Understand main objective, expectations, success metrics	<ul style="list-style-type: none"> Send MOU Send pilot deck with full details on pilot focus, expectations and success criteria 	<ul style="list-style-type: none"> Review MOU and sign Sign data sharing agreement if applicable Discuss and clarify success metrics and expectations 	MOU Slide deck	45 min
2	Design Session*	Designing key elements and implementation plan	<ul style="list-style-type: none"> Provide contextual information and overview of the data schema versions 	<ul style="list-style-type: none"> Provide contextual information about the pilot, overview of the project etc. 	Slide decks	60 mins
3	Implementation workshop (#1)	Instrumentation of research question Identification of variables from the schema	Provide support to Transcend and collaborate to <ul style="list-style-type: none"> Instrumenting a research questions using PICO framework Identify all variables needed to conduct analysis Cross map existing schema with new data schema Run analysis and report back findings using PICO framework 		Observation tool Reflection Tool	60 mins
4	Implementation workshop (#1) / Evaluation	Cross Mapping elements from current schema with new data schema for research evaluation	The Pilot will focus on the SEL domains of the schema to understand coverage, adoption and generalizability.			60 mins
5	Feedback process	Reflection on process and providing feedback	<ul style="list-style-type: none"> Provide a reflection tool for pilot sites to codify their feedback 	<ul style="list-style-type: none"> Provide feedback on process of conducting alpha pilot, add elements in schema for integration and other inputs 	Reflection tool Exit survey	Asynchronous & 30 mins 1:1

Appendix D

Review Criteria

As you read through the document and fill out the questionnaire, thoroughly review each module, sub-module, and elements and do the following:

1. Review each module for overall coverage.
2. Review the definition of each element for clarity and sufficiency.
3. Review each module's understandability. Ask -- are the elements' definitions similar to how you define them? If not, what are the key differences?
4. Answer the reflection questions after each module.

Feedback & Reflection Questions

1. Is the module exhaustive in its coverage of elements? If not, please elaborate.
2. Are there any elements that should be added to the module?

Module & Sub-Module	Element	Comments

3. From a researcher's perspective, is the level of specificity & granularity sufficient to articulate data needs for your partner organizations?
4. Are there any sub-modules or elements' that you are confused about and/or need further explanation or clarification? Please list them and explain them in the table below. Add more rows as needed.

Module & Sub-Module	Element	Comments

5. Please denote any further feedback and/or comments for the module.