Module #1. Develop a research plan

In this module, we present the skills and steps involved in developing a research plan. Understanding and using such a process, not only in school design but in subsequent iterations of practice in your school, helps put into practice the Carnegie design principle of continuous improvement of your school model. This module is divided into five sections:

1. Consider your population
2. Brainstorm a list of research questions
3. Evaluate your questions in order to prioritize the most important
4. Pick a research question to begin investigating and clarify it
5. Choose your plan based on your question and your audience

A Note About Empirical Research

Often, when people say they are "researching" a topic, they mean they are reading existing reports. This review of the existing literature is a critical first step with any new idea. You should be aware of the research efforts that preceded yours so that you:

1. Do not make the same mistakes as prior researchers;
2. Do not have to come up with your own language and messaging; and
3. Can consider the implications for your own work (e.g., your idea has been shown to be effective for girls but not boys, or your idea works great in well-resourced schools but is in effective in high-poverty schools).

Think of empirical research as other people's efforts to do pilot work for you! The focus of this document is doing empirical research, but you should also set aside some time at the beginning of your process to read empirical research. You will likely find that you are able to better focus and frame your research questions by taking this step.

A Note About Our Examples

In this and subsequent modules, we apply these ideas to a set of examples focused on the (fictional) school design team developing the (fictional) Lucretia Mott High School. These examples are grounded in the Carnegie design principle of positive youth development: they focus on the design team's work around developing their vision for their counseling and advisory program.

1. Consider Your Population

Before identifying your general question, first consider your target population. Who are they? What experiences do they bring that will both help and hinder your ability to learn what you want to know? What is going on in their lives that may change the way they answer your questions?

Describe Your Population

A great first step in getting to know your population is to take a look at the existing demographic data at feeder middle schools and/or nearby high schools. Given generally available data, we recommend considering the following questions:

- What percent of the anticipated population will be eligible for free or reduced-price lunch?
- What percent are expected to have Individualized Education Plans?
- What do you anticipate to be the predominant racial/ethnic groups in the school's population and what cultural backgrounds will different groups bring?
- How many expected students had attendance rates of less than 80 to 90 percent in middle school or below 75 to 85 percent in their first year of high school?
- What percentage is expected to have limited English proficiency? What percent, if any, are expected to be new arrivals to the United States?
- According to your state tests, how many students are considered to be performing at "Level 1" or "Level 2" in English Language Arts? in math? What does this generally suggest about their skill level?

Knowing the answers to these questions provides you with initial insight about which particular groups of students are worth examining in grater detail when you begin to analyze data. For example, if 25% of the students in your middle schools have low attendance, try to make these students roughly 25% of the students in any particular samples you learn from. If one-third of students were at a Level 1 performance level in ELA, then try to make these one-third of your sample of students.

Consider what's going on in the lives of students

Although you are trying to inform the design of a school that will be operating at various times of year, the reality is that when you collect your research, it will be at one specific time of year. Consider how this will affect what you learn. Did school just start? Did students just finish their standardized tests? Are you close to the end of the year? Did they just get back from winter break? All of these factors can have an impact on how students answer questions. For example, if you ask a student, "What makes a good counselor relationship?" at the beginning of the year, you might hear about how important it is to have help with the transition from middle to high school. At the end of the year, on the other hand, you might hear about preparing for college visitations. These considerations will help you to interpret responses more thoughtfully.

---

2. Brainstorm Research Questions

Key Information

The first step in using research in design is to brainstorm questions you want to answer. Your questions will be refined throughout the course of your research process. What are you curious about? How do great schools support students? What do you need to know to make sure your school works well for your student population? In brainstorming questions, we encourage you to continually return not just to the question, "How will our design work?" but also, "How will our design work for our students?" Draw on the Carnegie design principles to formulate your questions. The Carnegie design principles are an excellent frame for brainstorming your research questions. Ask yourself, "What do we want to understand better in order to make the ideas below (based on the ten Carnegie design principles) a reality in our new school?"

How will you help students to...

- Demonstrate mastery of rigorous standards?
- Engage through positive youth development and a personalized learning experience?
- Be supported through key transitions into and beyond high school?

How will adults in the school support these goals by:

- Cultivating a clear and coherent mission and culture?
- Developing and deploying their collective strengths?
- Effectively managing school operations and human capital?
- Maintaining structures that are porous and connected through networks?
- Continuously improving the school model?

Consider three types of research questions. When considering research in relation to design, the questions will often fall into one of the three categories listed below. The tools appendix contains a worksheet to guide you through the process of brainstorming questions:

1. Understanding people's perceptions and prior experiences with respect to a design principle. Some questions will broadly focus on stakeholder's perception of and experiences with one of the Carnegie design principles, such as personalizing student learning, youth development, or managing transitions. For example, by better understanding the experiences your prospective students have had with previous transitions in their lives, you can better design transitions that will support them in the future.
2. Understanding people's perceptions and prior experiences with specific practices or approaches. Some questions will focus on ideas you already have about specific approaches to making the design principles a reality. For example, consider a group that has decided that a key feature of their school will be same-gender groups that support one another through the learning process. To flesh out the design, this group might choose to investigate how students, parents, and school staff have experienced gender-based groups at other local middle schools and high schools.
3. Understanding the efficacy of specific practices or structures in helping students and adults. While you are still designing a school, it is unlikely that you will be able to test the actual efficacy of the practices you are considering. However, once your school is up and running, you will have opportunities to investigate whether and how particular practices are making a difference—you can return to these questions as your school develops.

In your first brainstorming of research questions, we recommend that you enter with an open and inquisitive mind. There are many challenges you will face in designing a great school and many questions you want answered. Get as many questions as you can all down on paper, so that you can remember them and return to them in the future. During this initial planning stage, you will not be able to answer all your questions—for this reason, you will prioritize those questions in the subsequent steps. However, noting all your questions now can allow you to return to and refine these questions as your school develops.

Application to Example

The Lucretia Mott High School design team sits down to discuss key elements of their model and the questions this raises for them. In the process, they brainstorm a series of questions. In this case, the design team decides to better understand their students. They focus on a few elements of the Carnegie design principles (shown in the column at left on the following page) as they brainstorm their questions:

Brainstormed Questions by Lucretia Mott High School Design Team	
Positive youth development	Have students ever had an experience where they were involved in a school-wide decision? What was that like? What worked? What didn't work?
	Do students think having a close relationship with an adult at school will help them? What experiences have students had that led to positive and negative relationships with adults at school? How do they think those experiences affected their academic experiences?
	What kinds of non-verbal cues are exhibited by teachers and administrators when students offer their perspective in a town hall style meeting? Do they appear to welcome the feedback or resent it? Does this non-verbal response affect the students' perceptions of the effectiveness of their contribution?
	What has happened when students have tried to participate in school decisions? (Reading through minutes of the school council meetings looking for student participation events to see what sorts of responses are generally elicited.)
Developing & deploying collective strengths	What happens when teachers feel like they are deployed into a role they are not suited for? How does that differ from when they are placed in a role in which they feel confident?
	How does a teacher's perception of his/her fit for his/her role in the school affect morale, physical stress, and timeliness?
	Comparing teachers in jobs for which they are trained to those who hold roles for which they are not trained: Is there a difference in their teacher evaluations or student progress on standardized tests?
Supporting students in transitions	How do freshman feel after being in their new school for one month?
	How does a new student orientation affect students' willingness to participate in activities? (Observing changes in participation rates over the orientation period.)
	What rituals have students engaged in in the past that have been memorable for them and how can these inform the development of rituals of transition at our school?
Rigorous standards for career readiness	What are teacher perceptions of what it takes to be college and career ready? What concerns do teachers have with the current focus on career readiness?
	Do parent perceptions of their schools' rigor affect whether they think their child will be ready for college or a career after high school?
	What kinds of behaviors are observed in classrooms that are focused on practicing 21st century skills?
	How do standardized test scores compare to a new Common Core assessment purporting to assess the same thing?

3. Evaluate Your Questions and Prioritize The Most Important

Key Information

Before settling on research questions to pursue and refine, you must evaluate their quality. Though you will ultimately choose one question to focus on now, it is good to identify a small set of important questions. To do this, consider your research questions in light of these three factors and identify those 5-10 that rise to the top.

1. Interest. How compelling is this question? Compared to other questions on the list, how concerned are you that, if you do not investigate this question, you will not have a full and deep picture of what your school can and should look like for your students?
2. Investigability.[1] How possible is it for you to evaluate this question and the sub-questions under it? Will you be able to take things that youth or adults say, do, or produce and review these in order to better answer the question?
3. Value. How much will it help you to have investigated this question? Compared to other questions on the list, how central are its answers to how you will design your school and decisions you will make about staffing, structures, and systems to support your students? To what extent can you already answer the question as much as you need to through existing empirical research?

When considering your possible research questions, keep in mind that the goal of the design process is to implement an innovative solution. We therefore need to ask questions that will provide the most valuable insight into our design. Oftentimes, people fall victim to believing that their designs will be perfect and they avoid testing them until they have to. Do not fall prey to this tendency! Do as much investigation as you can now, so you can have a realistic design—not just a design that looks great on paper. You will feel more confident in your conversations with parents and teachers if you have data to support your designs. Don't delay investigation! Do as much investigation as you can now, so you can have a realistic design—not just a design that looks great on paper.

---

4. Pick a Research Question to Investigate and Clarify It

The remainder of this guide and all the modules that follow focus on the process of investigating a single research question, something that can be repeated for other research questions later in your design and implementation process.

Key Information

Once you have a list of top research questions, it is time to pick one of these and move forward with investigating it. Segment your question into a few pieces you can measure – which means that you collect some tangible piece of information that you believe represents your specific interest. For example, measuring a student's academic success is something we do all the time, often by scoring student work or giving students a standardized exam of some kind. However, other areas of interest may prove more difficult to measure. For example, measuring the quality of student-adult relationships is more difficult. You would need to think about all the characteristics of a good relationship with an adult, and ask about each characteristic in turn.

Focus on what you can reasonably investigate. To measure many of the things we want to understand, we must gain access to students' beliefs through their words, behaviors, or artifacts. This means we can ask them directly for their thoughts (through focus groups, interviews, or surveys), we can watch them (through observations), or we can collect what they do (through student work). Almost any question is investigable with the right equipment, time, access and expertise. However, you want to figure out not only whether the question can be evaluated at all, but whether you can investigate it with your available time and resources. Here is a list of a variety of data sources, highlighting how they can help (and not help) your investigation:

[1] Investigability means that you can measure each element of the question in terms of things that can be said, seen, or produced

Methodology		Strengths	How is it limited?
Ask Them	Surveys. A questionnaire you devise (or borrow) that asks about your specific interests.	Facilitates standardized responses to standardized questions. Easy to analyze and, if well-designed, to interpret.	You have to be very accurate with your questions: Self-report is notoriously inaccurate, and it can be difficult to capture nuance and depth.
	Interviews. One-on-one conversations with students asking them about your specific interests.	Allows you to gain insight that is standardized enough to consider responses across people but flexible enough to pursue something different or interesting that emerges.	You have to be very careful in your interpretations: Self-report is inaccurate (especially face-to-face), and it can be difficult to know whether the anecdotes you collect are common.
	Focus Groups. Conversation with a group of students asking about your specific interests	Allows you to gain insight with maximum flexibility. Multiple perspectives from different participants can lead to unexpected clarity and insight.	You have to be very careful in your interpretations: Self-report is inaccurate (especially face-to-face, even more so in a group of peers). It can be difficult to know whether the anecdotes you collect are common.
Watch Them	Observations. An instance of your specific interest that you watch and try to capture what you see.	Provides great evidence of convergence.	Be careful in interpretations: You get no sense of people's thinking, it can be difficult to capture individual actions, and it can make an individual self-conscious to be observed.
Task Them	Performance Measures. Tasks given to students to watch them and/or interpret what they produce.	Provides extremely rich information that provides real world examples of your topic of interest.	Difficult to interpret: There is no perfect performance measure that can be generalized across individual differences of prior knowledge and experience.
Collect about them	District data re: ELL, SES, IEP, Ethnicity, etc. Data collected about the student characteristics.	Quick, standardized, and sometimes powerful information about the student that does not have to be collected by you! Provides useful context for other results.	Provides broad, surface level information that is typically NOT about your specific interest.
	Grades. Information about student classroom performance that could match closely to your specific interest.	A measure of student academic performance is taken seriously and has a great deal of real world impact.	Not generalizable across teachers, classrooms, schools, or districts. Highly grounded in context. Difficult to interpret for these reasons.
	Attendance. Daily attendance data typically collected in all schools and districts.	A highly regarded measure of student effort and investment. Is predictive of a number of risk factors.	Provides broad, surface level information that is typically NOT about your specific interest.
	Test Scores. Standardized tests given by the state to ensure students are making academic progress.	Highly standardized allowing for comparison of performance not supported by grades.	Standardized tests are often criticized for being shallow, so they may not assess deeper thinking. Test content may not match your specific interest.

Application to Example

The Lucretia Mott High School design team has committed to creating a school that will prepare students to succeed in college and career. In particular, based on the data they have seen about their student population, they feel they will need to engage students who have had negative interactions with adults in their prior schooling experiences. They therefore believe they must cultivate strong relationships between adults and students, especially counselors and students.

They think these strong relationships will support students in achieving academic success during their high school careers and ultimately help prepare them for their transition into college or career after high school. At this point in the development of their school design, then, they know that a core component of their work will relate to the Carnegie design principle of positive youth development, especially that of cultivating consistent and caring relationships between students and adults.

They posit that if students have an adult in the school they trust and can talk to, they will both attend school more regularly and get the socio-emotional support they need. If students attend school more regularly and get the socio-emotional support they need, they will be better prepared to engage in learning in their academic classes. If they are engaged in their academic classes, they will progress academically and ultimately demonstrate mastery of rigorous standards.

The design team has experience in urban high schools, but they feel they need more information about how to structure counseling support for the students they will be serving. In part, they want to raise questions about students' experiences with adult relationships: Do students think having a close relationship with an adult at school will help them? What experiences have students had that led to positive or negative relationships with adults at school? How do they think those experiences affected their academics?

They also have been trying to determine how staff-student relationships will best enable this support. They wonder: What are the perceived benefits students find of having close relationships with several teachers or of being especially close with one counselor? How do students balance their relationships with family with their relationships with school staff and how can this inform the design?

When they evaluate potential questions in terms of their level of interest, investigability, and value, they decide to focus on: What experiences have students had that led to positive and negative relationships with adults at school? They want to explore what successful relationships with adults at school look like for students in order to improve their school design. To further focus their question, they segment it into different pieces and think about each one. Student-adult relationships involve:

- Student perception of the relationship
- Adult perception of the relationship
- The outcomes of the relationship (such as whether students indicate more interest in college, whether adults are more confident in students' ability to succeed, and whether student grades improve)

They can measure the characteristics of positive and negative relationships with students through a variety of mechanisms.

---

5. Choose Your Plan Based on Your Question and Your Audience

Key Information

Oftentimes, when people think of research, they think only of quantitative data: breakdowns of student populations by racial/ethnic group, socioeconomic status, test scores, and the like. While this data should certainly play a part in your

analysis, when we approach a question, then, we must think in terms of a data plan that will enable deeper insights, not a single data collection point that depends only on data that is already easily available.

Why? When we research a question, we seek out convergence across multiple sources and methods: for example, the same message emerges from a survey, a set of interviews, and an analysis of quantitative data. This convergence allows us to be confident in our findings. If we find that sources diverge, then we need to dig deeper to find the answers to our question. This idea should not be unfamiliar to those working in education: it is similar to the point, often made but just as often overlooked, that to assess student understanding requires convergence across multiple measures, not just the scores on one test.

The simplest but most important question: Who are our students?

One research question that precedes all others is: Who are our students? If you don't already have a general sense of the background and sub-groups that you expect to arrive at your school, this should be high on your list of questions to investigate.

While you can engage in any mix of methods you wish to answer your research question, we recommend asking three key questions to help you decide where to start:

1. How sure are you that you know what the answers to your question are likely to be? Consider the question you are starting with. Do you have a good sense of what the exact possible responses to your questions will be, or are you more at a stage where you are open to a wide range of possibilities, including ones that you cannot predict?
2. Which sub-groups are of interest to you and how can you find them? We never want to just ask the question, How will this design work? but rather, How will it work for our students? Think of the different groups of students that will be coming to your school and which students will be affected differently by which designs. Often, the same design will need to be differentiated for students who have had different levels of prior academic success or engagement, as well as students of different genders, ages, and so on. Know who your students will be and ensure that you will have students representative of them included in your research.
3. Which schools are of interest to you and how can you conduct research with them? In the course of your research and design process, you will have to identify people to learn from—whether through surveys, interviews, observations, or other methods. As you do this, think about how you can approach schools that have a population similar to your own and/or where having a connection with these schools will be meaningful for your new school. For example, this could mean connecting with the eighth grade at a feeder school or ninth grade at a nearby high school.

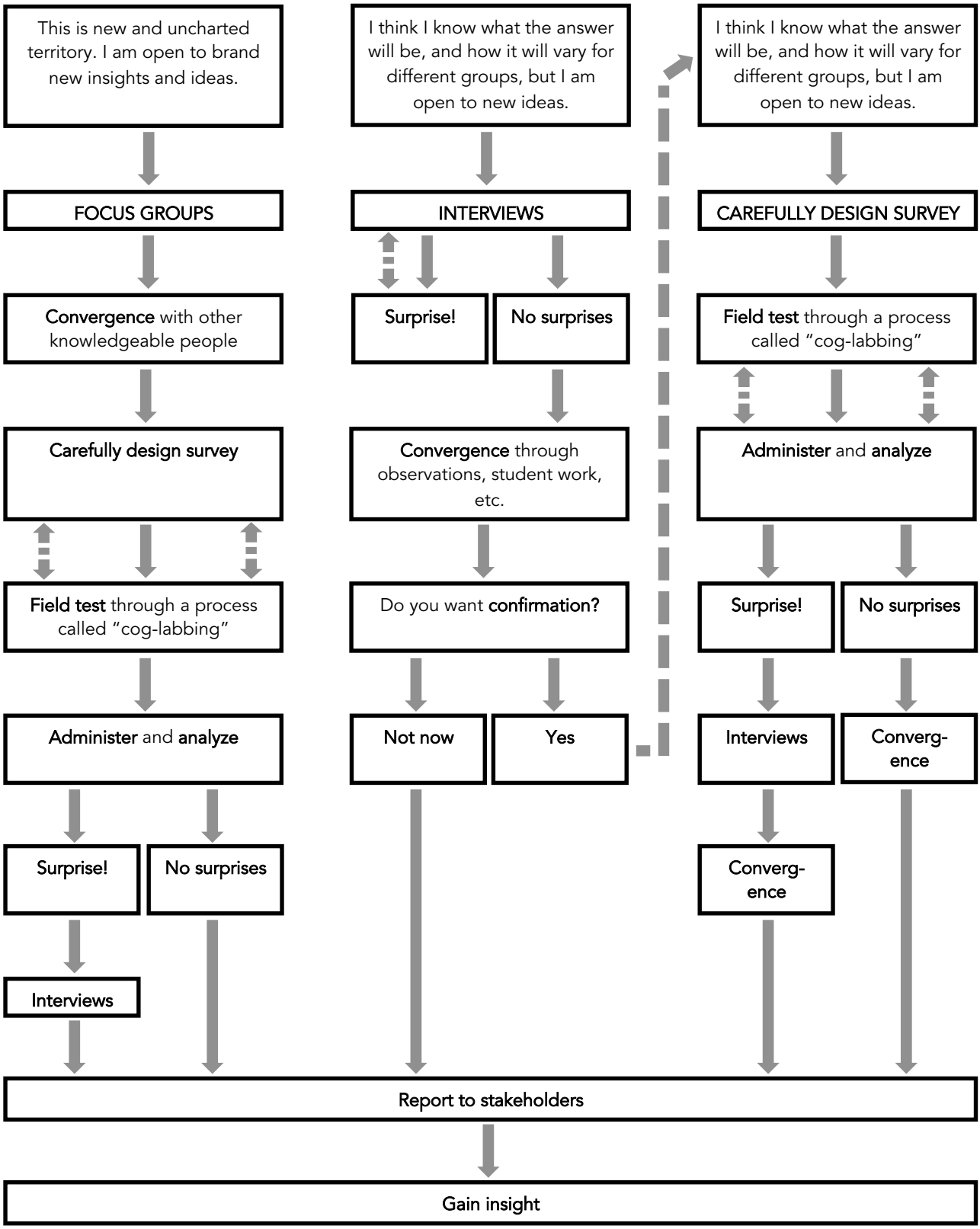
Keep in mind that you may need to go through a process to get your research activities approved by the school district. This is usually referred to as getting institutional approval through the district's institutional review board (IRB). This can take a great amount of time, so start getting approval early if you deem it necessary.

Research Partners, Not Subjects

As you explore these questions, don't just think about research subjects, think about research partners. How can you bring students, teachers, counselors, leaders, parents, or community members from other schools to be advisors on your design team to help you explore these initial questions? These people will be integral to the process of executing your research plan and can help you not only by providing feedback on questions but also by opening doors to engage others. Including their input also ensures you are embodying the Carnegie design principle of engaging student voice, integrating community input, and encouraging family participation.

On the following page, we've included a sample of the paths your data plan can take.

Three possible paths for your data plan



As you can see, there are three possible starting points for your data plan. At the top of the diagram, you can start your research with one of three methods—focus groups, interviews, or surveys—depending on your response to the question, How sure are we that we know what the answers to our question are likely to be? (Focus groups and interviews are covered in more detail in Module #2 and surveys and the process of "cog-labbing" surveys are detailed in Module #3.) As you embark on this step, plan for it to take some time to make initial arrangements and to start moving down your path.

Differing paths thereafter.
Depending on which path you begin with and what you find, you will likely go in slightly different directions, with focus groups possibly leading to interviews and surveys, or surveys possibly leading to interviews. These decisions are explained further in Modules #2 and #3. At this stage, it may take anywhere from one to several more days to move your understanding forward.

Administer and analyze
Each path also includes a spot for administering research methods and analyzing findings. If you are gathering interviews, observations, or artifacts, this will begin with qualitative analysis as described in Module #4. If you begin with qualitative analysis or with school, district, or survey data, you will engage in quantitative analysis as described in Module #5. This step will vary greatly depending on how much data you are analyzing, particularly if you are using qualitative data from interviews and open-ended surveys.

Convergence
Each of these three paths eventually reaches a box labeled convergence. It is at this stage that you want to check if your initial findings align with at least one other source: focus groups, interviews, surveys, observations, or artifacts. Module #6 describes ways of finding convergence and deciding whether you are confident in what you have learned or need to continue digging deeper.

Surprises
The process of research for design is partly a process of constantly telling and re-telling stories that can help you make sense of what you are learning. Sometimes, those stories fit with your own predictions as well as the predictions of the "common thinking" in your district. These are not particularly exciting findings. More exciting findings fall into one of three other categories, as shown in the box below. Depending on what you were expecting, these surprises may call for doing some further investigation to better understand how it should affect your design. This is discussed in Module #6.

	Finding Agrees with "Common Thinking"	Finding Refutes "Common Thinking"
Finding Agrees with Our Own	Ho-hum. So what else is new?	Oh, good! Highlights our innovation; worth documenting.
Finding Is Not What We Predicted	Surprise? Refine our research.	Surprise! Examine closely to better understand.

Report to stakeholders & Gain insight
At the end of any data plan, you arrive at the stage of reporting on what you have found, described in Module #7, as well as gathering reflections from others to gain insights into how this may change your design, as described in Module #8.

Application to Example

The Lucretia Mott High School design team is in the process of creating their research plan. The table below shows three versions of a question, each of which would lead them down a different path:

Question that leads to focus groups	Question that leads to interviews	Question that leads to surveys
What do students say about their relationships with adults at school and how to make these relationships supportive?	How could we help students develop strong relationships with counselors if we were differentiating groups by gender?	What should our major curricular units look like in same-gender advisory groups focusing on the four topics of: peers, family, academics, and future planning?