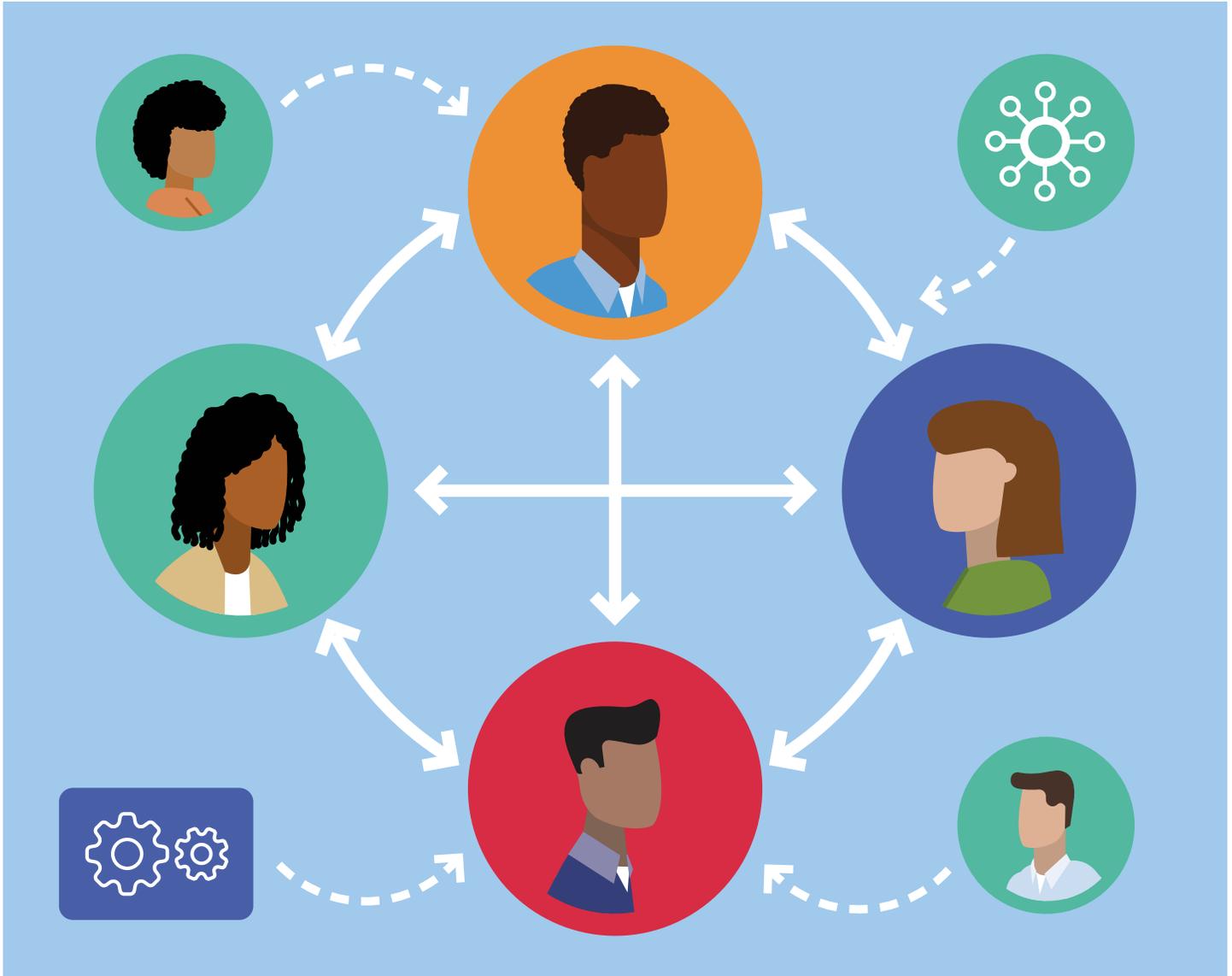


# Feedback Loops: Mapping Transformative Interactions in Education Innovation

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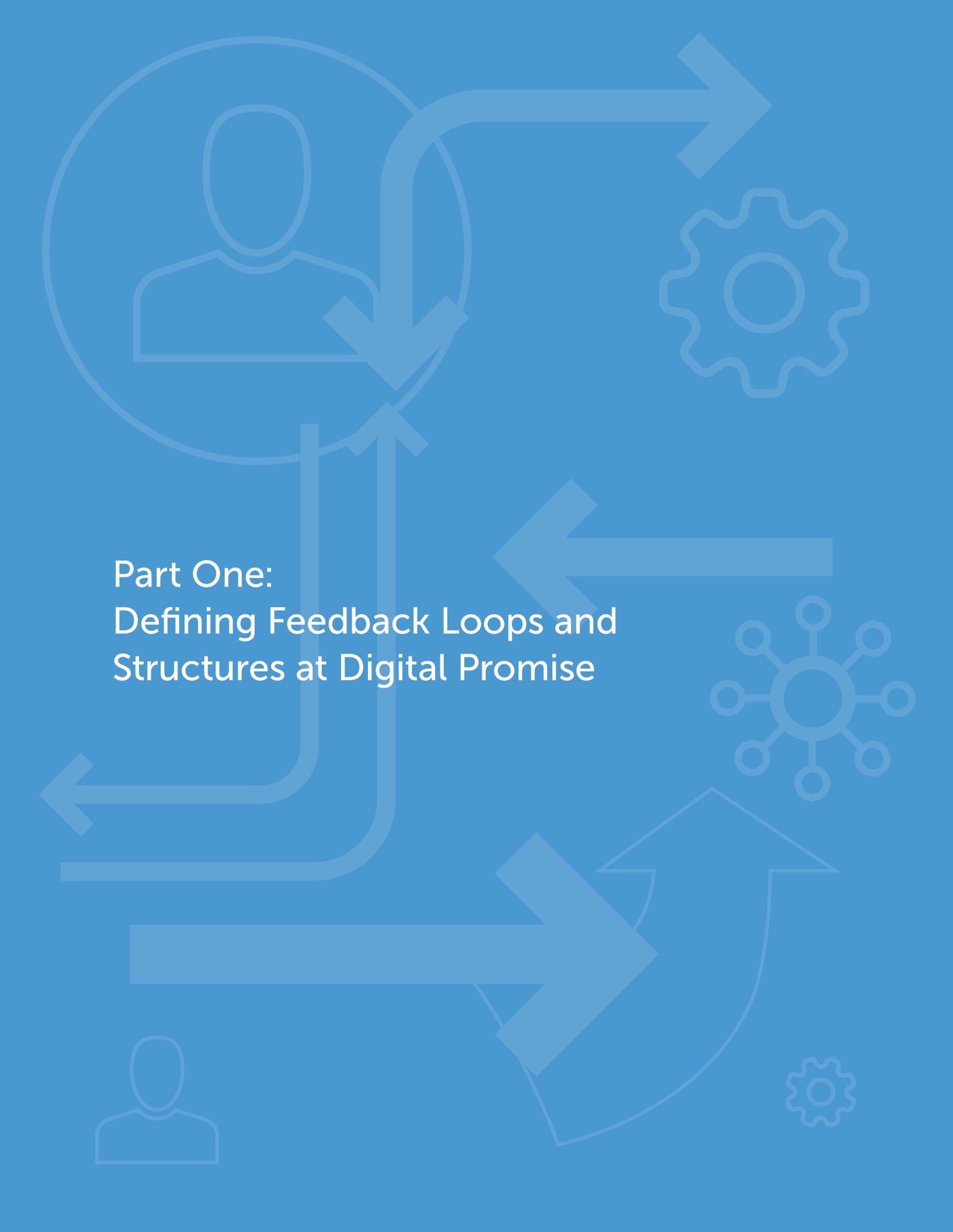


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Part One:  
Defining Feedback Loops and  
Structures at Digital Promise

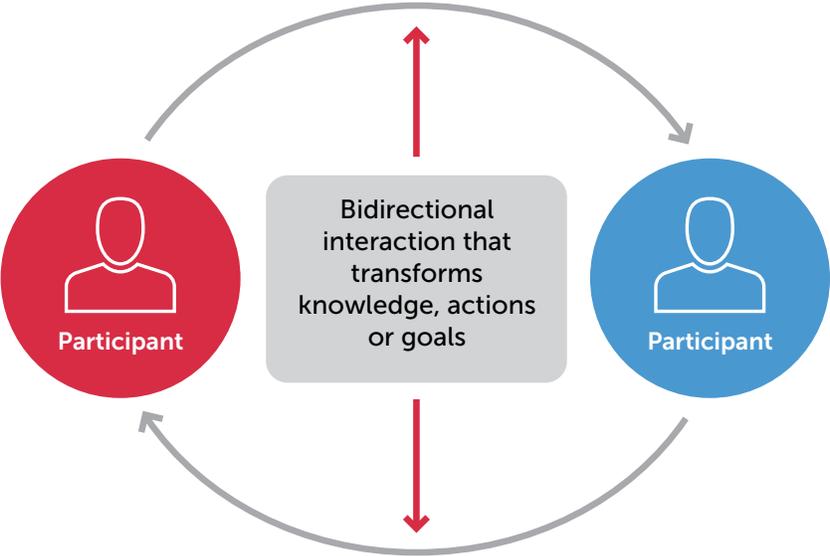
# Introduction

Digital Promise is a nonprofit focused on accelerating innovation in education and closing the digital learning gap. In order to accomplish that goal we employ networks, research, and stories generated from our work with a wide variety of external partners. Over the past months, we've been engaged in a process of evaluating and mapping the way we communicate and generate insights and knowledge and the ways in which our partners contribute, perceive, and share in that process. In particular, we are interested in how we can create new processes we call feedback loops that can aid us in including our partners in more meaningful collaborations, developing solutions that are better targeted to the audiences they are intended for, and elevating the voices, needs, and excellence of the members of school communities. We believe there are cases where feedback loops will provide superior outcomes compared to traditional methods of feedback, and we detail below our conception of feedback loops, their components, and places within the Digital Promise ecosystem where they are currently in use.

## Defining Feedback Loops

Feedback loops are structures and approaches to the way that parties engaged in a relationship share information and learn from one another. Feedback loops are related to commonly understood systems of feedback but contain distinctive features that set them apart. During the course of this work, Digital Promise came to define feedback loops as:

**An interaction between two or more parties that is purposeful, bidirectional, and iterative and transforms the knowledge, actions, or goals of the engaged parties.**



Contained within this definition are the criteria that make feedback loops unique and which can be used to analyze and build feedback loops in your own organization.

We see feedback loops as **purposeful**; they are intended to address problems of practice or better prepare the solutions to those problems to be taken up by the intended community. Feedback loops may not always be intentionally designed toward this end (i.e., they may occur organically), but they occur because a need has arisen.

We envision feedback loops as **bidirectional interactions**; the flow of information and knowledge in feedback loops moves in both directions for the involved parties. In contrast, simple feedback systems, such as a survey, tend to send information from one party to another in one direction only.

Feedback loops are **iterative**; the loops themselves are in flux and non-fixed, and the parties engaged in these loops are frequently changing the nature and process of the loops through their interactions.

Feedback loops are **transformative**; through the iterative process of the loops, new knowledge is created, new actions are taken, or new goals for the collaborative work emerge for parties in the loop.

Feedback systems may contain one or more of these characteristics, while feedback loops feature all four. Feedback systems are analogous to user or public opinion research in that they attempt to establish sentiment about a product or process and use that in its improvement and redesign. These are valuable approaches and can lead to significant increases in the impact of a product. Feedback loops, as we have conceived them, result in not only improvement in outputs, but create direct benefits for all participants.

Consider a school district that is preparing to complete a curriculum adoption for their elementary schools. In alignment with their strategic plan, they want to better connect with the parents in their school community and decide to include parents in the selection of their new textbooks. As they go through their adoption process, they invite a few interested parents into meetings with the textbook vendors, and like their teacher selection committees, offer them a vote on which textbook they should adopt. This is feedback; the parents tell the district what they desire, and the district considers it as they make their choice. However, to what extent was the parents' participation in this process valuable to the decision made? Did parents have a clear understanding of how their feedback might impact their child's learning? Was the process valuable in strengthening parents' understanding of how their child learns and the ways in which their school supports that? In this scenario, creating feedback loops could lead to a better outcome for the involved parties.

To create a situation that is bidirectional, iterative, and transformative, one could reimagine the ways that the district, teachers, and parents interact. Instead of a simple voting process after the vendor presentations, the district could create small teams of teachers and parents. In these teams, teachers could help build capacity in the parents to better understand how curriculum is implemented and its effect on the classroom, while parents could provide insight into how textbook materials might be used at home when work is assigned. This transformation and new knowledge constitutes a feedback loop, and through that process both the teachers and parents would be better informed and prepared to choose a curricular offering. To further the improvement, the district could shift away from a simple voting process and into a series of listening sessions with the teacher/parent teams where concerns and desires are highlighted and moved into another round of discussions which inform the final selection. This iteration and change are hallmarks of a feedback loop in flux and have potential to create a process that is better informed by the needs of the school community while building partnership and belonging.

Through the work undertaken at Digital Promise, we've been able to identify common patterns within our own feedback loops. Generally, we see patterns in participants and the roles they play and in the *structures* employed to create the feedback loops.

## Participants

Broadly speaking, participants are the entities that interact in feedback loops through the generation and passing of knowledge. These participants can be individuals or groups of individuals that represent specific perspectives or expertise and whose skills and knowledge contribute to the goals of the feedback loop. There are also administrative roles in feedback loops for participants—those who coordinate work and outputs, facilitate knowledge transmission, and otherwise maintain the loop as it evolves. Participants may cycle on and off of a feedback loop as it iterates.

Referring back to our definition of feedback loops—an interaction between two or more parties that is purposeful, bidirectional, and iterative and transforms the knowledge, actions, or goals of the engaged parties—it is important to note that there may be participants in a feedback loop who are not the definitional “parties” in the loop. Only two parties within a feedback loop need to have a transformational role, but there may be several other participants involved who make the loop function more effectively in various ways.

Within feedback loops, we see participants taking particular roles that contribute to knowledge transformation, and oftentimes an individual will play more than one role depending on the structure of the feedback loop. It also happens that participants may contribute to what becomes a feedback loop but not be involved in the feedback loop itself.

**Translators** are participants who serve to bridge understanding between communities in a feedback loop. In our work, we have seen instructional leaders as translators who help designers understand the needs of their school while creating buy-in and excitement in their districts around a given innovation. Our staff often work as translators as well, sitting in between researchers, developers, and practitioners. It is through our experience working closely with these parties—or having experience as one of these parties in prior work— that we are able to mediate understanding and communication.

**Facilitators** are participants who contribute to the management of the feedback loop process through planning, organizing, and leading engagements. They are actively involved in the creation and maintenance of the feedback loop. At Digital Promise, facilitators are often staff carrying out programmatic activities, such as soliciting practitioner input via listening sessions or running design workshops.

**Users** are participants in feedback loops who actively engage with their outputs. In our work, users are often the practitioners and system leaders with whom we are co-designing but may also be researchers or other relevant audiences.

**Informants** generate feedback for a feedback loop and offer the viewpoints of a particular community, but may not necessarily engage with the outputs of the feedback loop and are not a part of the feedback loop itself. At Digital Promise, we often encourage informants to contribute to surveys or interviews.

**Advisors** are participants with expertise that they share with the other participants in a feedback loop but who may not engage with the outputs of a feedback loop. At Digital Promise, we engage many of these individuals in the form of advisory boards consisting of education practitioners, researchers, developers, and other experts in the field.

**Designers** are individuals who construct outputs from the knowledge transformed in a feedback loop. In our work, we often employ a participatory design approach, positioning ourselves as co-designers and co-creators alongside the practitioners, researchers, and developers with whom we generate outputs.

## Structures and Applications of Feedback Loops

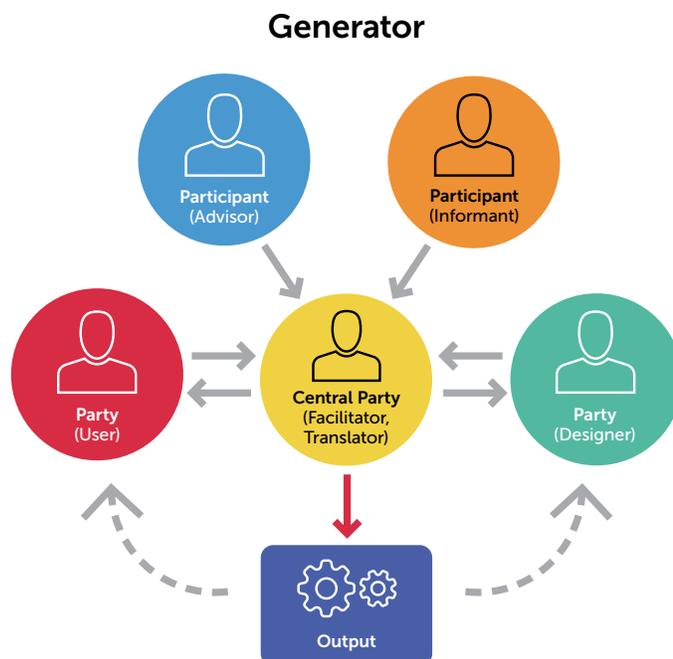
As prefaced in the introduction, not every scenario or goal requires a feedback loop; however, there are cases in which they may be more useful than a simple feedback system. Depending on the desired outputs, certain structures or organizing principles can be implemented to combine feedback loops into systems. In our work at Digital Promise, we've seen the value in applying feedback loops to assist us in co-designing outputs of our work that meet the needs of our partners, amplify the voices of practitioners and the under-represented, and collaborate around problems of practice in education, among many other uses.

**Structures** are the overarching forms that systems of multiple feedback loops take as they are implemented toward a larger goal. In their simplest form feedback loops occur between two parties, but larger scale projects may contain multiple feedback loops or loops with varying numbers of participants as needed to inform the outputs or even exist across multiple outputs in a program area over a longer time period. The nature of Digital Promise's work, which is often done in the context of networks or as co-designed outputs, has led to certain structures appearing more often. However, feedback loops exist across, but not directly correlated to, what we commonly consider to be modes of engagement: projects, networks, hubs, advisory boards, communities of practice, and so on. In fact, depending on the scales and goals in any particular program area or project, it is possible to see multiple feedback loop structures present or overlapping within those common modes of engagement. An additional important note is that the structures detailed below are idealized and generalized forms; in practice they are likely to be more complex and less clear cut, given the nature of shifting goals, outputs, and participants.

### Generator Structures

A frequently seen structure at Digital Promise is what we have labeled a **generator**. In a generator structure, one party sits in the center of multiple feedback loops. A key characteristic of a generator is that the feedback loops within it are happening concurrently in relation to a goal and their outputs are coordinated by the central party. In places where we have seen this structure, the coordinating party is often working to produce outputs that meet the needs of a particular audience, and the feedback loops are occurring with parties that are users of the potential outputs and/or have expertise and context that can inform and drive them. It is also possible that some of the interactions are not feedback loops but are unidirectional or non-iterative systems meant to simply inform the output.

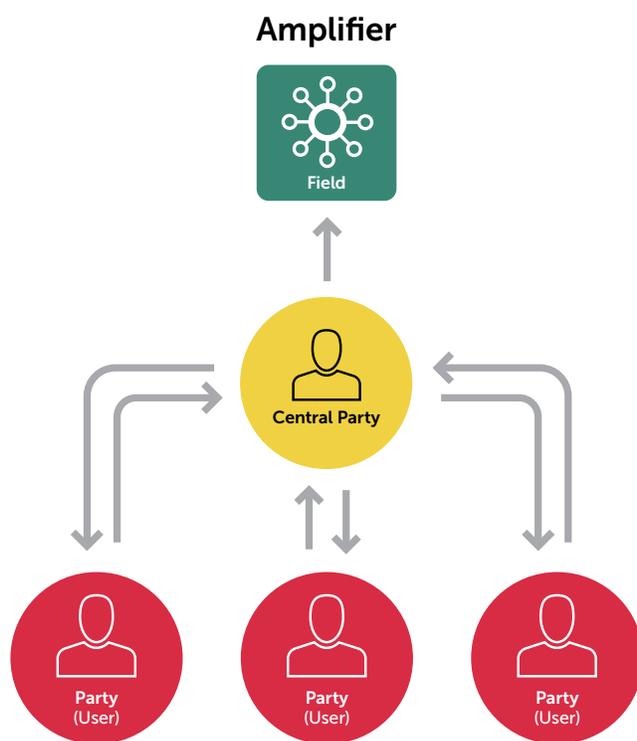
Generator structures have been employed at Digital Promise in the form of working groups that have driven the creation and revision of technical publications, practitioner teams generating criteria through which product certifications have been developed, and in



a number of research and design projects that partner with practitioners to develop learning solutions. We see generator structures as useful approaches to creating outputs that are attuned to the needs of educators and systems leaders, that are informed by the specific contexts of practitioners, and that involve partners directly in the creation of outputs.

## Amplifier Structures

**Amplifier** structures appear at Digital Promise in places where we are elevating the voices, viewpoints, contributions, and excellence of our partners in order to share them more broadly or connect them to external parties. In these structures, a central coordinating party sits between a set of parties with which they have feedback loops and the broader community to which they belong. This central party, by virtue of their expertise or capacity, can build, codify, and organize the knowledge of a particular community of practice, then share that knowledge with other partners that can benefit. Note that, in this structure, there are only feedback loops with one set of parties.

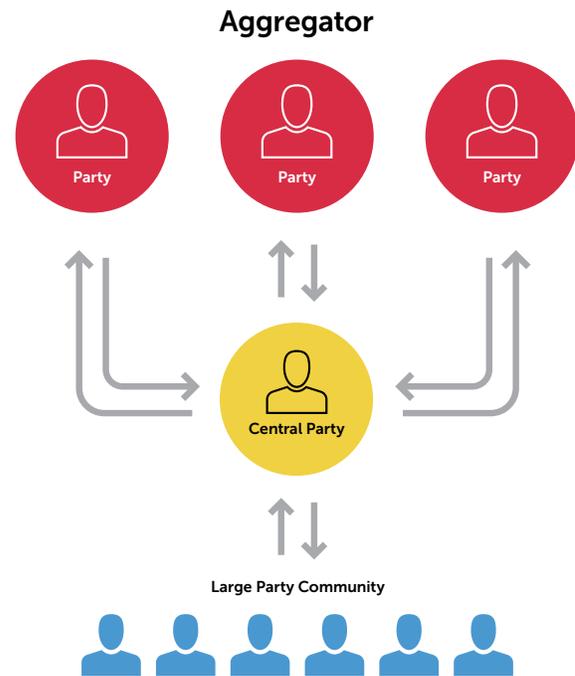


Amplifier structures at Digital Promise have been employed to build capacity with educators while highlighting their excellence, to impact education policy through empowerment of systems leaders and sharing their voices and needs, and to encourage and share more broadly youth innovation and leadership. We see amplifier structures as useful in building communities of practice and their prestige, to influence policy by disseminating practitioner need and voice, and to connect the field of education research and development to innovation that occurs at the smallest scale of school ecosystems.

An alternate activator structure we have recognized is an **aggregator**. The key characteristics of an aggregator structure are that it employs a party as a bridge between a small set of parties and a larger set of other parties. In this arrangement, the bridge party transforms and feeds back information in both directions, though the parties or either

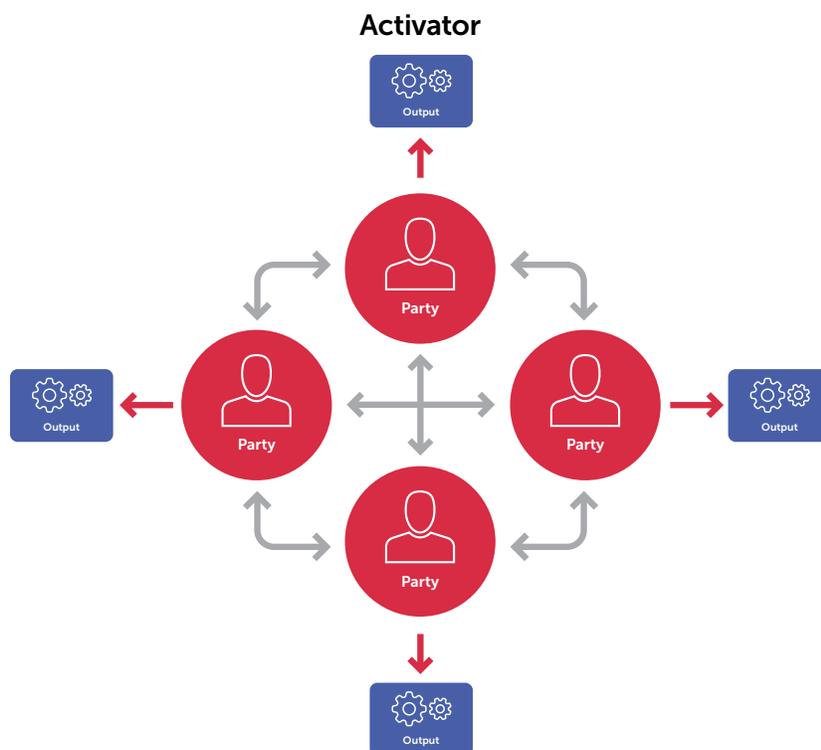
side may or may not interact directly. In contrast to the amplifier above, there are feedback loops on both sides of this central party.

Aggregator structures have been utilized at Digital Promise to evaluate and improve district technology rollouts, to understand and redesign college coursework to close gaps in success, to create communities that address the needs of practitioners, to implement and revise coaching in school districts, and create and target professional learning content to the needs of school personnel. We see these aggregator structures useful in utilizing data to inform decision making, or when you have innovations or approaches to scale and customize to a specific communities' needs.



## Activator Structures

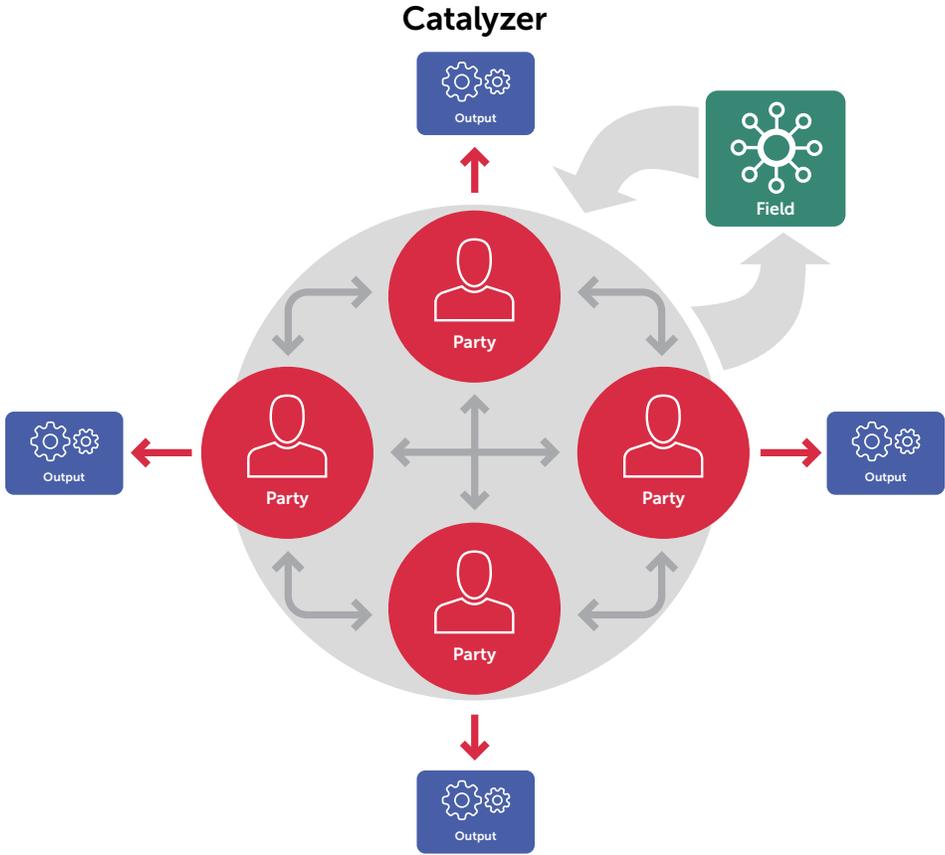
**Activator** structures at Digital Promise have been used to bring together communities around problems of practice and innovation. Unlike the other structures detailed thus far, activators have no central party. Instead, coordination of the feedback loops is a responsibility shared across the participants, and there is no single agreed upon output resulting from these interactions. As a result of their participation in these feedback loops, the parties leave with transformed knowledge over which they retain agency in how it can best inform their work. Commonly seen implementations of activators are convenings and conferences.



Digital Promise has applied activator structures to convene self-directed educator professional learning experiences, to help school systems reimagine their approaches to student centered learning, and to energize the global sharing of youth innovation. We see activators as useful structures to stimulate activity around pressing areas of need in the education field and in building communities and learning experiences for practitioners where they can innovate their practice.

An alternate activator structure is the **catalyzer**, which similarly has no central party. However, whereas an activator has no agreed upon output, the catalyzer has a larger goal of influencing

and being responsive to the field at large. Catalyzer structures have been used at Digital Promise to generate research agendas, to create and influence community around large-scale research programs, and to broaden participation in areas of emerging research.





## Case Study One: The Learner Variability Navigator



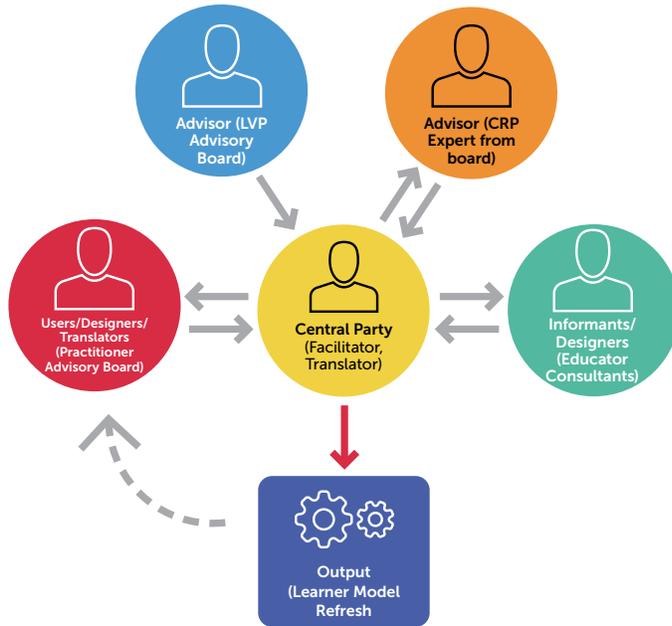
Structure	Party	Role
Generator	LVP Team	Facilitator, Designer
	LVP Advisory Board	Advisor
	Educator Consultants	Designer
	LVP Practitioner Advisory Board	User

Today's classrooms include a diverse student population who bring with them varied experiences and abilities. Much of our education system, however, has been slow to support students who may fall behind or be uninspired by traditional pathways of teaching and learning. The Learner Variability Project (LVP) at Digital Promise works at the intersection of researchers, educators, and edtech developers to design and develop a richer and more equitable education for each learner. The LVP team recognizes that learning sciences research provides insights into how best to engage our full diversity of learners. Consequently, they translate this ever-growing research into easily accessible factors and strategies that can inform both product design and classroom practice. The research-based factors and strategies together comprise the Learner Models housed in the Learner Variability Navigator (LVN). These Models are free, open-source, and based on a whole-child framework.

In 2021, the LVP team embarked on a process to update and refresh the Learner Models that support the LVN and, in particular, explore how they could be used to support culturally responsive practices. An LVP Advisory Board member with knowledge in this area suggested that the team crosswalk the LVN with an established and well regarded set of culturally responsive teaching practices. Based on this suggestion and the advisor's expertise, the advisor was asked to recruit a set of educators as consultants to conduct the crosswalk. At the conclusion of the crosswalk, the educator consultants noted that the strategies included in the LVN were largely student facing and determined that more guidance was needed around how an educator should reflect on their own bias when planning a lesson for learner variability. The consultants suggested, and Digital Promise concurred, that the next best step would be to create a guidebook with reflection questions and protocol to support the intersection of culturally responsive teaching practices with learner variability. Thus began a second phase of work, in which the educator consultants collaborated with the LVP team to create the guidebook. This guidebook, which has been completed, is envisioned as a companion to the LVN and will be included with the other resources that support educator use. Prior to its release, however, it will be piloted with the LVP Practitioner Advisory Board, a rotating group of educators who are trained on using the LVN and serve as a resource for the LVP team to connect to the needs of on-the-ground practitioners. As the Practitioner Advisory Board uses the guidebook, they will provide ongoing feedback to the team to revise and improve it before its release to the general public on the LVN.

Examining the interactions between the LVP team, Advisory Board, consultants, and the Practitioner Advisory Board implies the use of a series of feedback loops as they worked toward their goal:

## Learner Model Refresh



The structure that emerges when mapping these relationships is representative of the **generator** structure detailed above, with the learner model refresh as the output. The central party in this case is the LVP team, who also act as facilitators and who are engaged in feedback loops with three other parties. The LVP Advisory Board is not in a feedback loop with the LVP team as their interaction is not transformative for the board; however, their contributions kick off a feedback loop with one of their members. This second interaction between the LVP team and the individual board member is a feedback loop in which the parties are transforming knowledge about how to best include and promote culturally responsive practices into the LVN. This then generates a second feedback loop, in which a group of educator consultants engage with the

LVP team on a crosswalk to transform knowledge about the LVN and its affordances to promote culturally responsive practice. An additional indicator that this particular interaction is a feedback loop is that it iterated; upon doing the crosswalk, the parties concluded that a guidebook was needed, and shifted their goals and outputs in that direction. The central party is also engaged in a feedback loop with the Practitioner Advisory Board, who are the users of both the guidebook and the new learner model. The LVP team and the Practitioner Advisory Board will transform knowledge on how the guidebook can be implemented with a broader educator audience and make design changes accordingly, again illustrating the iterative nature of the feedback loop.

In this case, feedback loops served to push a programmatic goal forward by generating and utilizing knowledge across multiple partners and contexts to create an output of need. Had the LVP team chosen to rely on simple survey responses, the outputs may have been significantly different and not have addressed the goals that were driving the refresh. If the interaction with the educator consultants was not approached as an iterative exercise, the team may have been left simply with a crosswalk document and not a guidebook, which then would not necessitate the inclusion of the practitioner voice and redesign. Had the LVP not engaged actively with the practitioners, the guidebook itself may not have been revised and tailored to that audience and therefore not have had the impact the team desired. For the LVP team, engaging in feedback loops within this structure created synergistic effects, ultimately resulting in outputs to support their goals and vision that were organically generated.

## Case Study Two: Center for Integrative Research in Computing and Learning Sciences (CIRCLS)



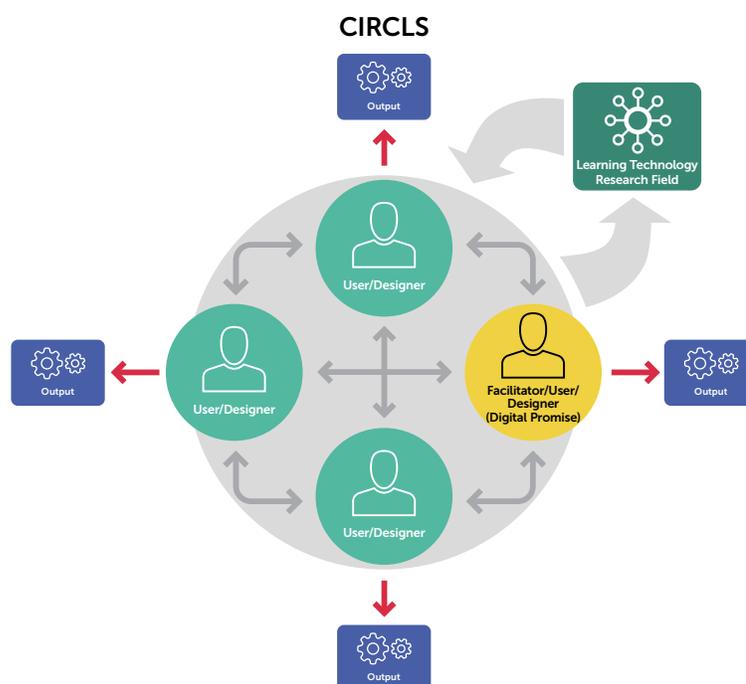
Structure	Party	Role
Catalyzer	Digital Promise and Co-Leads	User, Facilitator, Designer
	External Researchers	User
	Convening Program Committee	User, Designer
	National Science Foundation	Advisor
	CIRCLS Advisory Board	Advisor

Digital Promise, in partnership with Education Development Center (EDC), SRI International, and the University of Pittsburgh, co-lead a community-based hub for researchers who explore and investigate technologies that will be available to learners in 5–10 years. The Center for Integrative Research in Computing and Learning Sciences (CIRCLS) helps research teams collaborate, tackle bigger issues, and reach a broader audience.

CIRCLS serves the community of research teams funded by the National Science Foundation (NSF) to explore the future of learning with technology. Teams, which can include computer scientists, learning scientists, educators, graduate students, industry leaders, and policymakers, seek to advance understanding of how people learn with emerging technologies like virtual and augmented worlds, mapping and sensing tools, and artificial intelligence systems. CIRCLS extends its service to those who are not yet or currently funded, as well as people who are in adjacent, related communities who may never be funded by the program but who want to be involved( for example, teachers or industry members who want to learn more about research related to their products). CIRCLS advances communication of insights and findings, builds relationships, and convenes highly interactive events.

CIRCLS acts as a hub that provides service to a research community but doesn't exert a control relationship over the community itself. However, one of its goals is influencing and being influenced by the larger field of emerging technologies for teaching and learning research beyond CIRCLS. Digital Promise and their CIRCLS co-leads play both a user and facilitator role within it, managing engagements and communications with the field while participating in the activities. The structure of CIRCLS suggests it is a **catalyzer**:

Within the structure of CIRCLS, there are many opportunities for participants to engage in knowledge sharing and transformation. They convene every other year around themes of interest, provide proposal resources and mentorship, and host expertise exchanges, among other agenda items. The key catalyzer characteristic seen in CIRCLS is



that each participant in the feedback loops uses that transformation to inform their own work, as opposed to creating solutions to a single problem of practice collaboratively; these can and have influenced others in the community as well as the community as a whole.

One use of feedback loops within CIRCLS pertains to the planning and delivery of their recent convening. Digital Promise and their CIRCLS co-leads, acting in their facilitator role, established a program committee of CIRCLS community members in advisor roles specifically to develop the theme and strands of the convening. Working collaboratively over the course of nine months, they designed and iterated the program content. During this collaboration, participants from the larger CIRCLS Advisory Board and NSF took advisory roles, adding context to improve the convening, leading to further shifts and iterations in its development. As part of the planning process, the program committee informed its work via a feedback system. Attendees were surveyed to determine the content they would like to share as part of the convening, in what format they would like to share, and how they would like to participate in the convening. This feedback system supplied additional context that was fed into the convening feedback loop.

The feedback loop detailed above does more than just output the convening; it creates a coherent community designed to influence the larger research field by mobilizing participants around a theme of shared importance. Without the iterative approach with multiple advisors and informants, the collective buy-in could be reduced, and the power of the unified call to action could be diminished. In this way, the convening also serves to create new feedback loops with each attendee as they take away new understandings that can inform their personal work and create larger influence.

## Case Study Three: Maker Learning @ Home Cohort



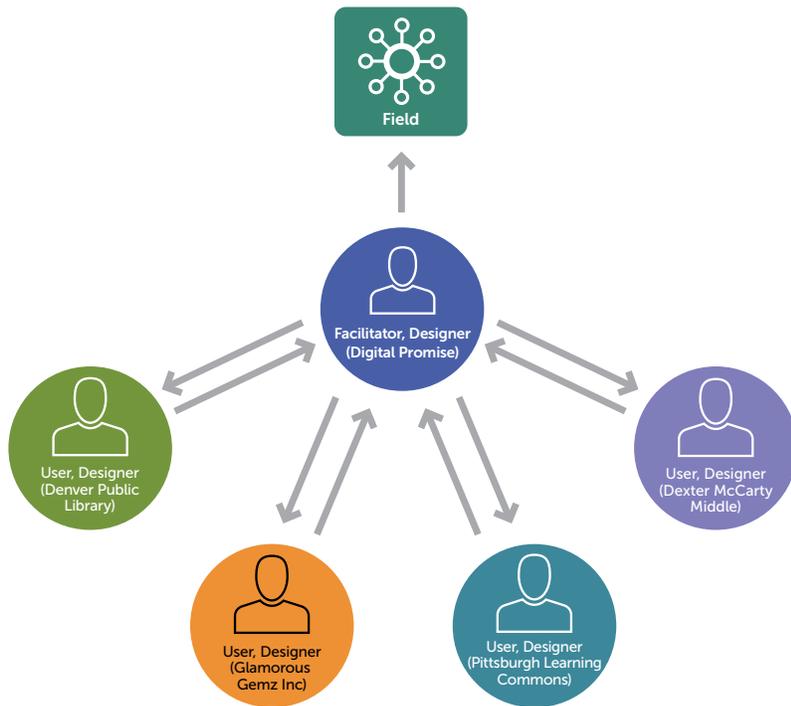
Structure	Party	Role
Amplifier	LED Team	Facilitator, Designer
	Maker Cohort Members	User, Designer, Translator

The Maker Learning @ Home cohort is a project of the Learning Experience Design team at Digital Promise. This work was developed as a response to the COVID-19 pandemic, knowing that for the learners we serve, the shift to distance or hybrid learning amplified inequitable access to meaningful, impactful maker learning experiences. Educators everywhere were faced with designing engaging learning for a virtual format with limited assistance. To aid their work and support maker learning more broadly during this time, Digital Promise created an initiative to offer a six-month professional learning experience to educators in the field. A goal, in addition to supporting the cohort practitioners, was to capture and distill the successes of those creating home-based maker learning experiences so that all educators could learn how to continue providing access to these experiences.

In February 2021, six educators representing four organizations were invited to participate in this experience. The educators expressed a deep commitment to their learners, communities, and to the process of collaborating and learning together. Digital Promise supported each organization in designing a unique maker project and providing \$5,000 to actualize their project. At the culmination of this cohort experience, Digital Promise published the Maker Learning @ Home Project Guide, an Open Educational Resource (OER) including each of the organization's project guides, as well as protocols and strategies for planning relevant and accessible home-based maker learning experiences.

The cohort process was designed with an intentional equity approach, and the Digital Promise team made several decisions in the beginning of the process that led to unique outcomes through what they deemed "learner-centered professional learning" with the cohort members. The team worked to create the conditions that allowed cohort participants to co-design the learning environment and culture collectively. As much as possible, the cohort was designed to allow the educator to make decisions based on what was best for their communities and their projects, treating cohort participants as the experts within their contexts. This approach was facilitated by the program design. Cohort members met with the team in a 1:1 setting where they would complete deep dives into their potential projects in a consultatory fashion, and these 1:1s were used to drive the design of a monthly full-cohort meeting. This collaborative approach led to space for new outputs to emerge as the project progressed. In this scenario, the Maker Learning @ Home initiative acts as an **amplifier**:

## Maker Learning @ Home Cohort



Over the course of the professional learning sessions, the Digital Promise team and cohort members were involved in feedback loops together that transformed their knowledge and eventually the goals of the initiative itself. The Digital Promise team was the central party, holding a facilitator and designer role by guiding the activities of the cohort and co-designing the outputs. The cohort members held user and designer roles by virtue of their place as co-designers and played a translator role as well. Because the cohort members are both designing for themselves and their school community—as well as members of the larger maker educator community—they were able to identify areas of need and potential outputs of high value.

As an amplifier, the goals of this initiative were to share with the field the efforts of practitioners working to provide quality learning experiences under difficult circumstances and best practices by which they could do the same. However, initially the outputs were to be project specific guides that each educator would produce for their context. Through engaging in a feedback loop with cohort members, the Digital Promise team was able to reflect on and consider the direction of the project, as well as define a new output and goal—a project guide that was more widely applicable to the field. Through the interactions, an additional output emerged as well: a professional learning guide for those who want to facilitate a similar cohort experience. This realigning of goals and iteration is a hallmark of an ongoing feedback loop, which, in this case, provides more value to the participants than a feedback system would, and was only possible through the intentional design of the program to provide space for this to occur.

## Case Study Four: OER For Racial Justice



Structure	Party	Role
Novel, Generator plus Catalyzer	CII Team	Facilitator, Designer, Advisor, Translator
	Core Team	User, Designer, Translator
	Pilot Districts	User, Informant

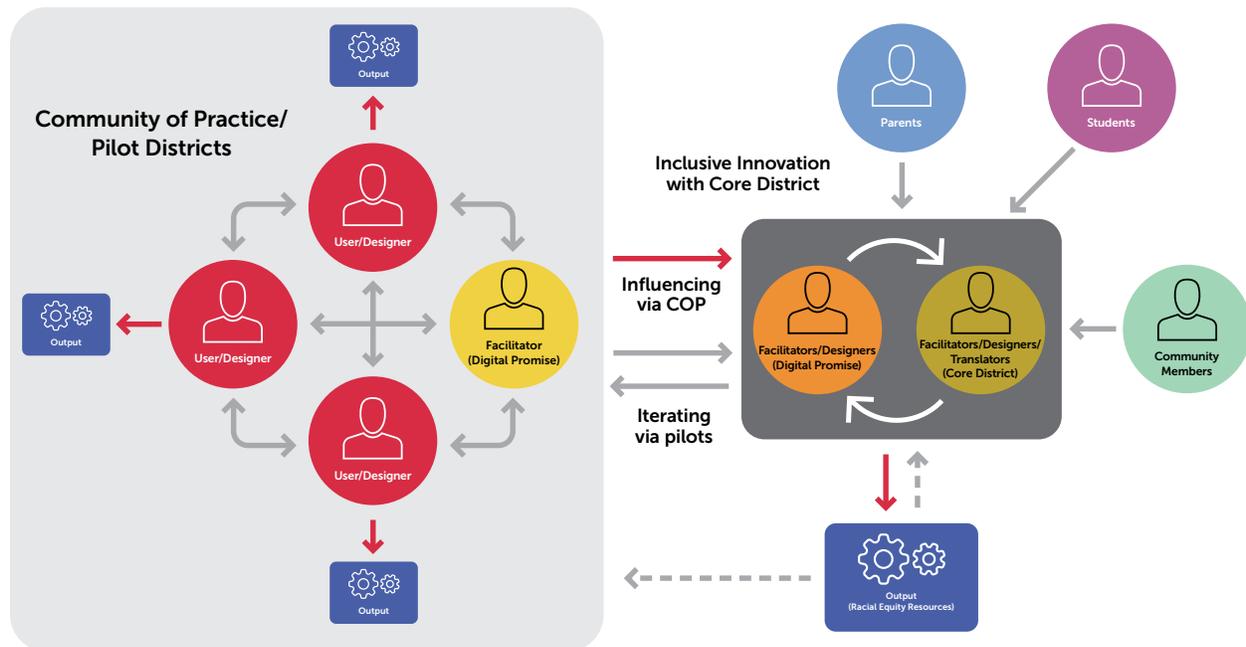
The Center for Inclusive Innovation (CII) at Digital Promise supports communities to engage in equity-centered research and development to change the trajectories of Black, Brown, and Indigenous students, reimagining education research and development by resourcing the creative ingenuity of communities to create liberatory education innovation designed to enable self-determination. This process of Inclusive Innovation moves iteratively across five stages: Connect & Commit, Inquire & Investigate, Design & Develop, Implement & Iterate, and Sustain & Scale. Community is the central strand on which the research and development work is anchored. Developers, researchers, and community are intertwined, yet at the same time each may play a lead role in a different aspect of the work at each stage. What sets the Inclusive Innovation model apart from traditional research and development is that it results in solutions that have been informed and developed by co-experts, including community stakeholders, developers, and researchers. Co-design of solutions ensures they are contextually and culturally relevant. The five stages provide a roadmap for mutual partnership, embedding an awareness of community context so that solutions produced through this process are effective and can be implemented in similar contexts.

One of the projects underway in the CII is focused on creating open educational resources that support racial justice. In this work, the Digital Promise team will engage with 13 districts in a design process, resulting in materials that aid discourse around social justice in the classroom and the professional learning needed to support practitioners in that work. Of the 13 districts, one serves as the “core” district and 12 as pilot districts. In the core district, there are two district administrators and a community member serving as leads for a team composed of teachers, students, school leaders, community members, and parents. Additional students, teachers, and community members are brought into the project to offer more context and support at key points (e.g., focus groups, design sessions, etc.). This core district team will work through the Inclusive Innovation process with Digital Promise to co-design the outputs. The 12 pilot districts will have some touchpoints in the design process and eventually field test the resources.

The feedback loops within this project are numerous and complicated. First, the core district, by virtue of proceeding through the Inclusive Innovation process, is involved in several loops with Digital Promise. In the Connect and Commit phase, the two parties are building trust and shared commitment, transforming their relationship with each other. During the Inquire and Investigate phase, the two parties are generating new knowledge together, creating measurable outcomes that indicate progress in addressing the challenge. In the Design and Develop phase, the two parties are collaborating to create new solutions.

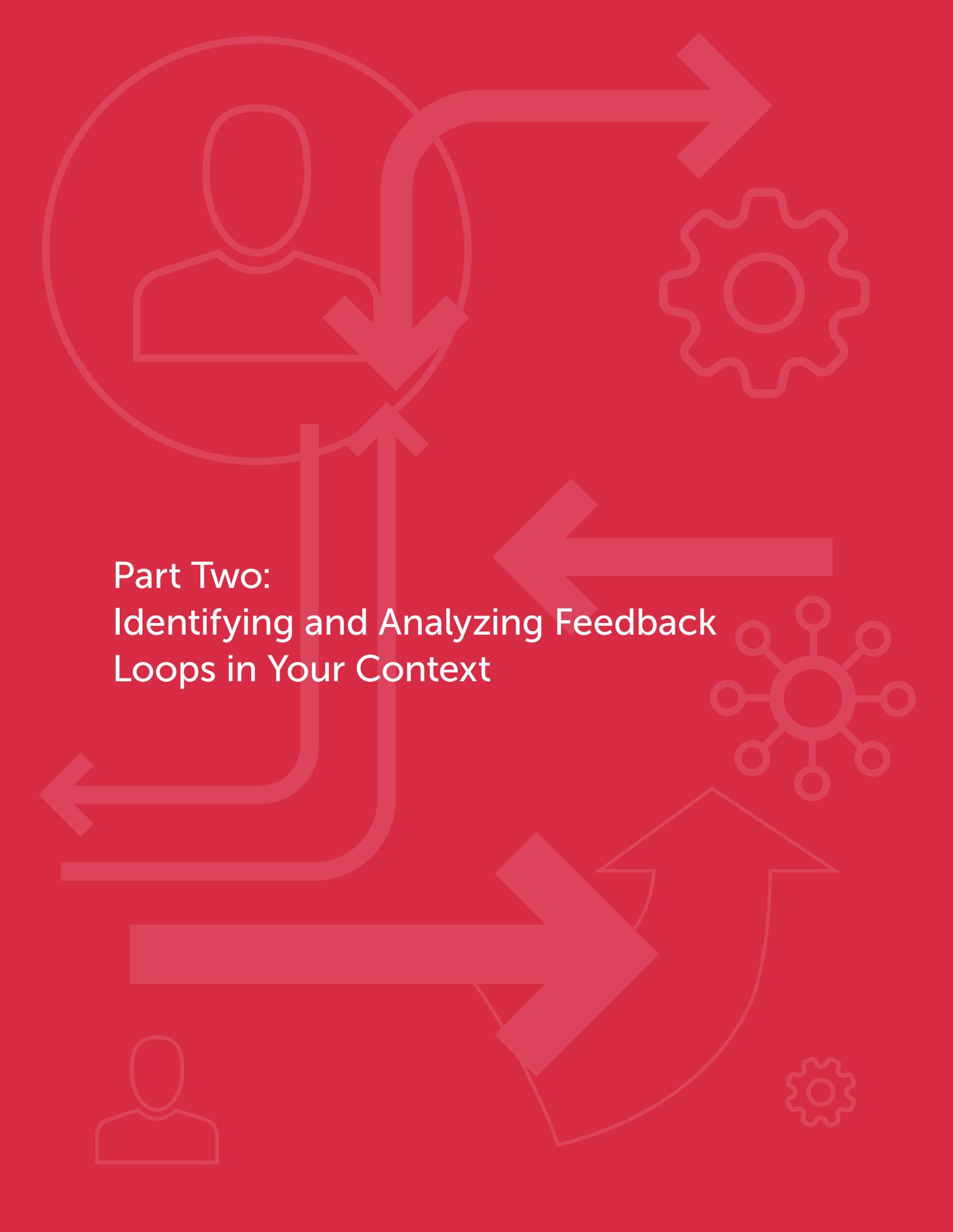
As the Inclusive Innovation process plays out, the 12 pilot districts are also in a feedback loop with Digital Promise, the core district, and each other. Through a community of practice, they transform and generate knowledge about advancing racial equity in their communities. Digital Promise plays a facilitator role in this interaction but is not the central party, and outputs from the community of practice are fed into the loop between Digital Promise and the core district, informing their co-design.

This arrangement between the parties and the feedback loops they maintain does not neatly align to other structures commonly seen across Digital Promise and thus has been highlighted here as novel.



To some extent, this initiative appears as a generator structure connected to a catalyzer structure. The Digital Promise team and the core district are engaged in the feedback loops maintained by the Inclusive Innovation process and, like a generator, produce outputs informed by the community. Of note, however, is that there is no central party in this generator structure, likely because the **first phase of Inclusive Innovation produces a partnership that functions to place power equally across the two parties**. This new partnership becomes a single entity that is a party to the second feedback loop, playing both a designer role and a user role as the core district intends to utilize the resources that are produced. To some degree, the partnership also plays a translator role, sitting between the creation of the outputs and the communities in which they are intended to be used. Meanwhile, the pilot districts in their community of practice are similar to a catalyzer structure. As a community of practice, they transform knowledge that they then apply to their own contexts but, also through the process, create influence on the co-design teams of the generator structure in a pseudo-informant role. Not only will they produce influence and inform, but at some point when the piloting and revision of the materials begins, they will enter into a feedback loop with the co-design team as they iterate in the role of a user.

This example serves to remind that when innovative approaches are taken toward problem solving, as is the case with the Center for Inclusive Innovation’s mission to radically rethink R&D from a place of equity, simply reproducing the structures within which we have always worked is likely to constrain the potential impact. This project realized as only a generator or only a catalyzer would not achieve the same outcomes.



Part Two:  
Identifying and Analyzing Feedback  
Loops in Your Context

Included here are steps that you and your team can take to identify feedback loops in your work and better understand how they impact your mission. After generating and validating your feedback loops and structures, you can work to understand how they currently influence your work or how they may be refined in order to better address the needs of your partners and your organization's goals. This analysis can assist in creating more fruitful partnerships, generating more meaningful and useful outputs, and addressing inequities inherent in program design.

## Finding your feedback loops

There are three parts to identifying feedback loops in your organization:

- Sourcing case studies
- Evaluating those case studies
- Validating and iterating your learnings

Utilizing these measures will generate a set of outputs that you can compare against the structures identified above and prepare you to think deeply about the ways in which creating and modifying feedback loops can make your work more inclusive and tailored to the needs of your partners.

## Sourcing Case Studies

In order to begin your process, you'll need case studies from your organization. These case studies will provide context and evidence of the ways in which you interact with your partners and will serve as the basis for your evaluation and analysis.

To source case studies, begin by mapping out the connections between your organization and your external partners. You are working to elicit the touchpoints you have with external partners at a high level so that you can closely examine the places that hold promise as feedback loops. This mapping can occur in a number of ways; you could manually list your initiatives, their leadership and their partners, pull data from a platform like Salesforce or other CRM application, or make connections visually in diagrams. To learn about how Digital Promise leveraged social network analysis to map their connections, read appendix item [Lessons from Social Network Analysis](#).

**An interaction between two or more parties that is purposeful, bidirectional and iterative, and transforms the knowledge actions or goals of the engaged parties.**

With this high-level mapping complete, you can now conduct a closer examination of your connections. To begin this process, revisit the definition of a feedback loop:

Reflecting on this definition, review the connections you made, looking for indications of transformation or bidirectionality. Initial indications of these criteria will be promising scenarios from which to build full case

studies. To guide your work as you create these full case studies, consider developing a template to collect them. In Digital Promise's approach, we created a template that allowed us to collect information on the parties involved and their activities, document a detailed overview of the interaction, and record our analyses. Another protocol which Digital Promise leveraged, which could be useful when looking for indicators of feedback loops, is thinking in terms of scale read appendix item [Looking Across Scale](#).

With a template prepared and promising feedback loops identified, begin the process of investigating and building your case studies. Start by filling in as much information in your template as you can, and then move to interviews and discussions with the parties involved in the interactions that you flagged as potential feedback loops. You'll want to initially identify as much detail as possible: who is involved, the goal of their work together, how they interacted, how the work evolved over time, and other specifics. Interviewing the parties directly will lead to the most valuable insights and make evaluation in the next step more efficient.

## Evaluating Case Studies

To confirm feedback loops are happening in your work or to identify places where they could be included you'll need to evaluate each of your case studies against the definition of feedback loops and the associated criteria. In this phase of the work and after an in-depth read of the case studies, consider the possible structures in play, look at participants and their roles, create visual diagrams, and investigate the bidirectional loops further. We found that this phase of the work was more effective when involving team members and including multiple viewpoints. These team members had no direct stake in the findings and were able to offer relatively objective feedback.

### Initial Structures

Begin by reviewing the overall goals or outputs of the interactions within the case study. Consider whether the parties are doing the following:

- Collaborating to create an output, suggesting a generator structure may be involved
- Sharing ideas or information with a larger field, suggesting an amplifier or catalyzer structure
- Collaborating on problems of practice to inform their own work, suggesting an activator structure
- Working with sizable communities or large-scale data collection practices, suggesting an aggregator

Make note of your observations here as they will be useful when creating visualizations, but don't constrain your thinking about how these interactions might be arranged.

### Participants and Roles

Next, identify the participants involved in a particular case study, and consider what role they are fulfilling. Review the role definitions in part one of this document and determine which role the participants play:

- Facilitators, who are managing the process
- Designers, who are generating the outputs
- Users, who apply the outputs to their contexts

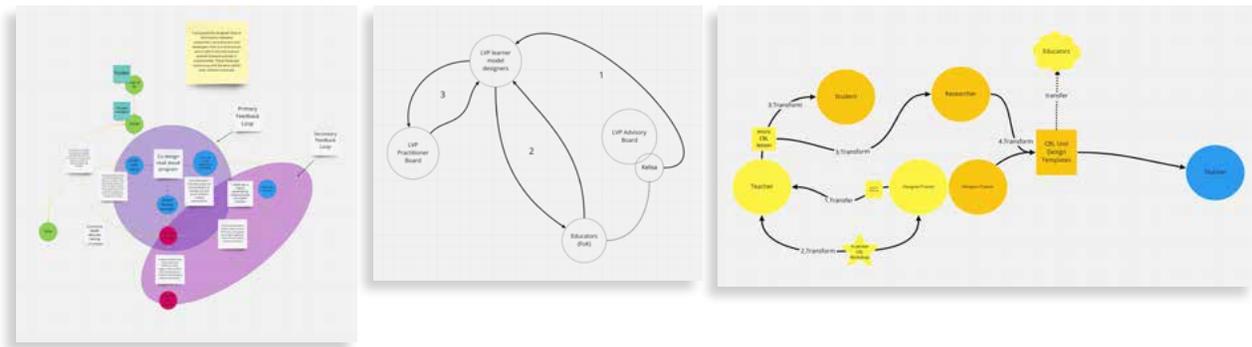
- Translators, who build understanding across parties and their contexts
- Informants, who supply information
- Advisors, who provide knowledge and expertise

Recall that it is possible for participants in feedback loops and structures to play more than one role or for their role to change over time. Make note of this as you see it, as it can be potential evidence of the iterative nature of feedback loops.

## Visualizations

The next step in evaluating feedback loops is to create visualizations or diagrams of ways the parties are arranged with respect to each other and the goals or outputs of the interactions. In Digital Promise’s work, we used a virtual whiteboard application to build and revise these visualizations, but you could use office software, pen and paper, or sticky notes and wall space.

Begin this process by placing all the parties into your workspace and arranging them spatially, considering who they interact with or what role they have assumed and what structure you have identified initially. If you have a facilitator, consider whether they are a central party who is coordinating the outputs as you might see in a generator. If there is no central party, play with arrangements that represent activator and catalyzer structures. At this point in the work, no choices are fixed, so move your parties around freely based on what you have gleaned from a close read of the case study.



When you reach the point at which you have a general sense of the arrangement of the parties, you can begin to create the connections between them. Pulling from the information contained in the case study, look closely at the interaction between any two parties in the workspace and connect them via arrows. Recall that feedback loops are bidirectional and occur between two parties. In cases where the interaction is informative or advisory but does not transform the knowledge, actions, or goals of the parties, use a single arrow connecting the party outputting information to the party receiving information. In cases where there is bidirectionality, as evidenced by a transformation, use an arrow in each direction. If there is an output, connect the parties who develop that output, like designers or facilitators, to it. If there are users of the output, make sure to connect them to the outputs as well. See the Learner Model Refresh case study above for examples.

## Review

With the connections made between parties, you can review your workspace for the existence of feedback loops and bidirectionality, as well as correlation to the initial structures you identified as a fit for the interactions.

Start with a careful re-read of the interactions between parties, and ask yourself these questions:

- What transformed between these two parties? Did they collaborate to generate new knowledge, or did the interaction cause something to change in the outputs of the work? Both of these would be hallmarks of a feedback loop.
- Was the interaction iterative and recurring, or was it a one-time interaction that passed information from one party to another? Iteration would indicate a feedback loop, while one party only receiving information from another is unidirectional and not indicative of a feedback loop.
- Is the role you have assigned them accurate?

Answering these questions will provide you with context to carry out the validation process below.

After reviewing the individual feedback loops, consider the initial structures you assigned to the interactions. Reflect on whether the initial structure is accurate based on where the feedback loops exist, whether there is a central party, and the overall goals of the structure. If the initial structure you suggested is not accurate, ask yourself these questions:

- Where are the feedback loops between parties, and where are the unidirectional interactions? How do these compare to the structures outlined in part one of this document? For example, in aggregators, the central party has feedback loops on both sides of its interactions between communities and smaller groups, but central parties in amplifiers only have feedback loops on one side of their interactions.
- Who is responsible for the output? If there is no central party managing the outputs, consider whether each party has control over their own outputs as in activator or catalyzer structures.
- Could you have a novel structure? This is possible and can be better examined in the next phase of the work.

After reviewing your initial pass at creating the diagrams and evaluating your feedback loops and structures, it is important that you go back to the parties involved in the work to confirm that your interpretations of the case study are accurate. In the next section, you'll validate and reconfigure your structures based on the feedback you receive from those carrying out the interactions.

## Validating and Iterating your Loops

At this point, you have provisional feedback loops and structures. It is imperative that you follow up with the parties in these interactions to build a more coherent picture of their perceptions, how they interpreted their participation, and their relationship to other parties and the outputs. In Digital Promise's work, we found that this validation process, in which we talked through our conception of the feedback loops in a collaborative, interview-like format with the participants, led to a much deeper understanding of the interactions.

You should approach this validation process from two directions. In one, utilizing the perspective of the central party, facilitators, or “creators” of the feedback loop will help you to understand the intent of loops relative to their outputs and any changes that occurred along the way. The other, in which you learn from parties not necessarily central like users or designers, will help you to better understand how they perceived transformation occurring within the role they played. Expect to hear differences in the accounts of participants connected to the roles that they played in the feedback loop structure. Set aside time to test your assumptions about the feedback loops and their structures with both of these audiences.

You should expect to iterate on your initial conceptions of the feedback loops and their structures as well. After you have had the opportunity for a deep-dive with the participants, take a critical eye to your work thus far. Does your output accurately capture the roles, loops, and structure of your case study? If not, make the necessary changes to individual loops or roles as needed. A larger question ensues if the overall structure is not accurate. It could be that the roles or outputs are misaligned, or it could be that the generalized structures do not totally capture the interactions. If the interactions are not totally captured, consider whether some combination of structures would be a more appropriate fit or whether your structure is novel.

In fact, in Digital Promise’s work mapping and analyzing the Center for Inclusive Innovation’s OER for Racial Justice initiative (see above), there was no clean fit with any of the generalized structures. Through validating the case study with the parties and several rounds of iteration, we were able to identify that the initiative was best represented by a combination of catalyzer and generator structures. Therein lies the value of the step of the process. Having a clearer understanding of the interactions through review with the parties and the associated iteration elicited a novel structure and opportunities to learn about its impact.

## Understanding and Implementing Feedback Loops and Structures

Detailed below are steps you can take to learn from your feedback loops.

### Your Approaches

One simple application of the process you’ve just worked through is to identify patterns and gaps in the way that you commonly work and to confirm how you currently operate your feedback loops. Consider these questions:

- What roles do we play in our feedback loops?
- Is there a common structure we use to achieve our goals?
- Are the structures we use correlated to their best applications? (See structure discussion in part one.)

The nature of our approach at Digital Promise has led us to use multiple structures, but organizations with more narrowly focused work might only use one or two. The key, then, is ensuring that the structures in use are well suited to achieve your goals. For example, if an organizational goal is to promote equity in STEM education and a method to achieving this is sharing success stories of teachers who take intentional steps toward inclusivity, then an amplifier or catalyzer structure is best suited to accomplish that goal. If you find that you tend to employ generator structures, then an evaluation of its effectiveness is in order.

## Partners in Your Work

A principal value in learning about feedback loops in your organization is to grasp a deeper understanding of the ways in which you work with your partners and how modifying those interactions might benefit them while improving the outputs. Consider these questions:

- What roles do your partners play in your feedback loops?
- What are the patterns in the way you transform knowledge together?
- What expertise do your partners bring into your feedback loops?

One important step is to evaluate alignment. Though you may have partners occupying the necessary roles to create a feedback loop, examine to what extent they are best suited to play that role. For example, including a superintendent in a feedback loop focused on improving mathematics instruction is reasonable given their knowledge; however, they may not be close enough to the implementation of instruction to be a designer. In this case, you might employ a mathematics teacher in the designer role and ask the superintendent to apply their education systems experience as an informant or advisor. Another aspect to consider is how you transform information with parties in your feedback loops. At Digital Promise, we often engage in capacity building practices with our partners, and through that process they develop new skills and knowledge. We can then derive learning from our partners' applications of those new skills and knowledge in their practice. Beyond professional learning, we commonly engage in transformation through the process of co-design. You should consider how you engage your partners, how you facilitate transformation, and how it generates value for both parties.

## Equity Considerations

Front and center of any analysis of organizational behavior should be a consideration of equity issues, belonging and inclusivity. We believe that thinking about relationships through the lens of feedback loops can assist organizations in doing that. We detail our process of developing equity lenses in appendix item [Developing Equity Lenses](#), but encourage you to do the same. Consider the following:

- How are power dynamics at play between parties in your feedback loops?
- Who shows up across your parties, and who is absent?
- How have you made your feedback loop accessible?

Ideally, feedback loops are more than a lens to think about equity and instead become a vehicle to move toward its implementation. **In creating these structures, there is an opportunity to build arrangements that redistribute power, that strive toward community ownership, and that recognize and celebrate the humanity and excellence of all involved parties.** We advocate not only that you ensure the presence of underrepresented voices but that those voices are sufficiently elevated to account for historical exclusion and that participation in any feedback loop comes with agency and autonomy to shape the direction of that participation.

## Mission Alignment

Organizations can use the mapping and analysis of their feedback loops to understand how a given initiative is aligned to their mission or ways that they can build new feedback loops that support it. Consider what outputs are critical to your mission and what structures you could leverage to improve or create them.

As an example, one team member of this project representing our Pathways and Credentials program area used their knowledge of and experience with feedback loops to inform the development of their 2023 strategic plan. Currently, the [Product Certifications](#) program serves to inform the field about the quality of certified tools. Though the Product Certification criteria are co-designed with practitioners and often learners, it remains largely informational in nature, as once the certifications are created and earned there is no continued interaction with the practitioners. In a design charrette, the team lead, along with two practitioners, ideated around the idea of feedback loops that could better connect product developers and districts. The outputs of this design work led to a reimagining of the interactions between edtech providers and school districts with an idea that feedback loops could change the way pilots and iteration occur with technology adoptions. This iteration, as well as the transformation that could occur with parties, is more focused on the aspects of systems change that align with Digital Promise's recently adopted [strategic framework](#).

## Closing

In the two parts of this document, we've offered viewpoints on why feedback loops are an important component of designing work with external partners, how feedback loops can be structured to achieve specific goals, and how other organizations can carry out this work. As Digital Promise moves into its pilot phase, there are opportunities to ask and answer many additional questions about how best to design and leverage feedback loops to improve education for all students. We hope that this document can assist our peer organizations in beginning their discussions around feedback loops, and we look forward to building momentum and collaboration around these ideas.

## Going Further

The process undertaken by Digital Promise to date has been descriptive in nature; we have worked to understand where feedback loops exist in our current interactions and where patterns and gaps have emerged. The next steps are to utilize this information to begin to diagnose why these patterns exist and their impact on our work and how we might leverage feedback loops and structures to realize our [North Star Goals](#). Part of our ongoing approach will be to develop and pilot a novel feedback loop structure or new implementation of an identified structure to answer these and other emerging questions.

One area of continued investigation is to create more clarity around when feedback loops are useful and when we might choose not to use them. Currently we see value in applying feedback loops to create outputs tailored to the needs of our partners; to connect research, development, and practice; and to build meaningful communities of practice, among other things (see structure discussion above). However, we can envision that not every structure is a good fit for a particular goal, output, or community. For example, in a given line of work, we might find that using an amplifier structure to share with the field prior to building meaning, engagement, and excitement around a concept with an activator structure could lead to misalignment in goals and desires of the participants within those structures. Likewise, continually using

activator structures where parties take away their transformation to their own work but never share with or influence the field could limit broader impact. Ultimately, for transformation to occur, there must be value for participants, so there should be continued investigation into the “when” and “why” of applying feedback loops and structures.

An additional question to address is related to how we think about participation and ownership of collaborative work with our partners. Part of creating equitable, meaningful partnerships consists of understanding the power dynamics at play and building relationships with our partners in which they’re viewed not only as informants but as equals and even owners of the work. As we continue to explore the applications of feedback loops, we intend to investigate how feedback loop structures can be leveraged to create more collaboration and community ownership of our work, which we believe is essential to creating solutions that lead to powerful learning.

## Reflections

Included here are a few reflections on the months-long process of mapping and analyzing feedback loops at Digital Promise.

One recurring conversation in our design sessions was around the idea of feedback loops being bidirectional or multidirectional. In our initial conception and definition, we envisioned feedback loops as multidirectional—something akin to a cyclical relationship between parties involved in work together. However, as we analyzed the case studies and began mapping out how the connections were occurring and what the focus of those connections were, it stood out that in each case it tended to be between two parties whose “knowledge, action, or goals” were transformed. At this point, it is more accurate to think of the larger feedback loop structures as multidirectional and consisting of multiple smaller bidirectional feedback loops.

Another common point of discussion was internal feedback loops between projects and teams within Digital Promise. To some extent this was prompted by a collaborative network mapping exercise we undertook early in the process, but there are many valuable questions to be asked and answered in this line of investigation. In particular, our team members were interested in how our internal feedback loops might be modified to better connect research and practice or outreach into new educator communities or how we might build new structures to leverage our expertise in support of that. Beyond building mission-aligned internal feedback loops, there are likely opportunities to impart positive benefits in areas like program design or workplace culture.

A final reflection is simply that identifying parties and their roles is a complicated process. The titles used above are admittedly reductive. We are focused on essential characteristics of a party’s participation but acknowledge that people are multifaceted and in feedback loops can often play more than one role. Additionally, those roles themselves are not always clearly defined in a given initiative, particularly when they arise more organically. It is also notable that parties can cycle on and off of projects and in and out of feedback loops, and their roles may change along the way, particularly when the feedback loops are iterative. We also saw, in the OER for Racial Justice study, a scenario where the interactions between two parties caused them to act more like a single party, which was an unexpected learning. We look forward to further investigation and learning about the roles parties play in feedback loops.

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# Appendix

## Protocols

Detailed below are the protocols developed, modified, and used over the course of our investigations into feedback loops. In undertaking your own investigations, consider adopting or adapting them or creating your own to fit the needs of your team and external partners.

### Lessons from Social Network Analysis

A core part of the first phase of this work involved identifying the “who” and “how” of partnership across Digital Promise’s networks and projects. With that, time was dedicated to learning from the process of social network analysis (SNA), an interdisciplinary field of research that works to understand relational structure between entities and the impacts of those structures ([Butts 2008](#)). SNA is highly computational in nature, but for our purposes, we were concerned with arrangement and connection between parties rather than the mathematical outputs. Learning from the [social network analysis handbook](#) published by the [International Rescue Committee](#), we undertook a process of mapping for each of our network teams the arrangements of our interactions with external partners. For an organization like Digital Promise that has many initiatives and many partners within those initiatives, this was a large task. In lieu of working through the entire process, we paused before beginning the recommended influence mapping. Though understanding influence can be valuable, we were able to leave the process with useful information about who we partnered with in our different networks and how we tended to engage them and, in some cases, how those partnerships crossed over network teams. This information was important as we undertook the taxonomy portion of the work and informed our identification of parties and roles.

### Process

This process occurred over the course of two internal meetings and asynchronous time as needed by team members. Prior to the meeting, the facilitator pre-generated a Miro board (virtual whiteboard) that contained a space for each of our network teams.

1. Within these spaces, each team was provided with a red circle that represented Digital Promise and a blue circle that represented external partners. The teams were then encouraged to think about who their external partners were and create additional circles as needed with the according label. We asked that they think at a larger grain size (e.g., researcher) rather than smaller (e.g., Professor Doe at Starfleet Academy).
2. The teams were then asked to consider how their interactions were structured with their partners. Specifically, the team was asked to consider if their interactions were bidirectional or unidirectional in how the communications occurred.
3. They were then asked to move, add, or rearrange their circles to represent the high-level interactions teams had with their work and to use arrows between to indicate the directionality of that interaction. They were also encouraged to draw intrateam arrows where strong connections appeared.
4. Finally, the teams completed a gallery walk of the network maps. Each team lead used sticky notes to create “noticings” and “wonderings,” which were debriefed in the following team meeting.

This process led to a rich representation of Digital Promise, its initiatives, and our partners.



From this mapping and the noticings and wonderings of the team we were able to better visualize the structure of our work, which prepared us to source feedback loops from our teams more widely. It also led to continued conversation around the directionality of interactions and helped us to further refine our definition of feedback loops, as well as provided source material during the taxonomy process.

## Developing Equity Lenses

At Digital Promise, we believe that each person at every stage of their lives should have access to inclusive, powerful learning experiences based in fact and that affirm and honor all identities, perspectives, and cultures. Thus, it is important that when we undertake our work we approach it with an identified equity perspective. In this project in particular, we are exploring our interactions with external partners so that we can better meet their needs, and along with that comes a responsibility to understand how and why those needs exist. Recognizing the way that underrepresentation and under-resourcing has impacted our partners' participation, the ways that our implicit biases affect our relationships, and how historical structures and patterns have excluded people from opportunity are important parts of ensuring we do not inflict harm and that we reconcile and repair relationships when we do. To this end, our teams collaborated to develop a set of equity lenses that we could apply when analyzing feedback loops and that can inform our pilot work.

## Process

This process played out across two internal team meetings and asynchronous work. The facilitator created the discussion prompts and brainstorming space prior to the meetings.

1. During a synchronous meeting time, team leads were prompted into an opening discussion. They were asked relative to equity to consider what characteristics would be at the forefront of a critical analysis of our networks and how we might highlight promising practices and places for improvement.
2. After the group discussion, team members were then asked to complete a silent reflection before moving on to the collaborative activity, asking them how equity shows up in their work and how they identify it.
3. The team then moved into collaborative work. Considering the core assumptions of our project and

their self reflections, they were asked to brainstorm, in a Jamboard, what they would consider to be the “hallmarks” of an equitable feedback loop. They were scaffolded by the following statement:

*For example, if our core assumption is that marginalized communities are underrepresented, we need to analyze our networks for the presence of their voices and viewpoints.*

4. After brainstorming, the group spent time discussing and synthesizing the contributions on the Jamboard and identifying the themes that emerged.
5. After themes had emerged for our equity lenses and we had built consensus, the team then collaborated to identify indicators of the lenses. For example, if an equity lens was something like “transparency,” we might suggest an indicator like “documentation is kept in a shared folder.” These indicators are equity “look-fors” in the eventual analysis of feedback loops.

This process resulted in our team identifying a few initial equity lenses: presence, power, and agency. The indicator development process was not without contention. However, our team members felt it was important, and rightfully so, that we not generate an assumption that equity was something you could check off a list. With that in mind, we reiterate here that these are simply “look-fors,” which can provide initial indication that there is something to be investigated further. These lenses and the indicators have already begun iteration after work with our external partners and will continue to do so as we apply them in our analyses.

## Interviews and Insights

To better inform our work, we planned and carried out interviews with a selection of external partners. The goal was to generate insights—statements that combine the specific needs of our partners with our professional knowledge and provide generalized guidance for our process. This was an essential part of the work, as our partners were not aware of the concept of feedback loops and were not part of the team that conceptualized them, and so it was unclear how they would respond. These initial interviews, though short, allowed us to test ideas about feedback loops and to gauge partner receptiveness to the ideas and applications.

### Process

This process played out across three internal team meetings and asynchronous work.

1. During a team meeting, a discussion was held about the interviews to build consensus around who we might interview externally and what we wanted to learn.
2. The team leads then recruited partners to conduct interviews with individuals from their network.
3. Prior to the interviews, the team leads met again to discuss protocol and questions they could ask consistently across all partners.
4. The interviews were conducted with the selected external partners.
5. The team leads then held 1:1 meetings with the lead facilitator in which they reviewed and synthesized learnings from the interviews and generated insights.
6. The teams then shared their interview insights with the whole team in an additional meeting.

