Expand Your Reach and Launch Maker Learning for All

By the end of this chapter, you will:

- Evaluate the importance of starting with the why when introducing maker learning within your school system.
- Identify ways to leverage Maker Champion teams to model inclusive maker learning practices.
- Gain strategies you can use to engage adult learners in developing an inclusive maker learning mindset.

View from the Field: Invest the Time

WARNING: Just because you have a team of Maker Champions does not mean that everyone else will adopt inclusive maker learning practices. School leaders also need to invest in building teacher capacity in the areas of inclusive maker learning. Those who do will see higher rates of inclusion and integration of maker learning in their districts.

In working with a variety of school systems, I have met school leaders who take a very intentional, phased approach, dedicating time for teachers to dive in, make powerful connections, and develop next steps to support maker learning for all students. Others I have worked with believe that teachers learn by observing their peers in informal settings and will use makerspaces and resources when they see fit.

Each of these types of leaders has a strong rationale for their actions. I have found, however, that the leaders who take the time to invest in building educators' understanding around the value of maker learning, who address how to make it accessible to all students, and who identify what resources are necessary have higher educator engagement and commitment to this work. Educators in their systems are more likely to make meaningful connections between standards, curriculum, and the process of authentic problem-solving and making. School systems that provide the time to coach administrators and teachers through a series of intentional professional learning opportunities move ahead of their counterparts at an accelerated rate.

Build Understanding Across Stakeholder Groups

Creating an inclusive maker learning culture does not start with furnishing a makerspace, purchasing 3D printers, or collecting cardboard. Instead, it begins with a school system's ability to define and communicate their core values and beliefs around inclusion, accessibility, and innovation. To have maximum effect, these communications must reach all stakeholders: district leaders, school administration, teaching faculty, students, and families.

Simon Sinek, in *Find Your Why* (2017), purports that innovative leaders inspire change by starting with the why behind their work. Sinek warns that many organizations start with what they do, then how they do it, and neglect communicating *why* they

do it. Starting with the why, moving to the how, and then to the what provides opportunities for inspiration and innovation to develop in steadfast ways.

Following Sinek's reasoning, a powerful definition of maker learning offers a jumping-off point for stakeholders to investigate what key elements increase the accessibility of maker learning experiences and resources. Then your work should focus on developing a strong rationale for why an inclusive maker culture is advantageous and necessary. Once this is in place, the focus of professional learning should turn toward developing a deeper understanding of the Universal Design for Learning (UDL) Guidelines and what applying these principles in the context of maker learning experiences looks like. (Chapters 3 and 4 offer activities and ideas to assist stakeholders in visualizing this.)

To inspire change at a systemic level, you need to unpack inclusive maker learning, addressing such essential questions as:

- Why is it important to develop an inclusive maker learning culture?
- How do we use Universal Design for Learning Guidelines in the context of maker learning?
- What do makerspaces, design studios, and their resources offer students?

Specifically, school leaders and educators should focus on what it looks like to increase accessibility within learning experiences and environments. Start with what people are most familiar with and provide concrete examples of what makes that learning environment highly accessible and inclusive. One option may be to provide participants with some common examples of how learner variability is addressed within a learning environment or lesson, such as offering students a specific choice of tools and methods they can use to demonstrate and express learning. Another set of examples could model how information is presented to students in a way to help them perceive it and act strategically, such as bolding specific terms or directive words within a student task or using graphic organizers to construct meaning.

After providing examples to get started, expand this work by having participants elaborate or generate more examples, relating them to aspects of the design process and elaborating on what can improve these learning experiences and environments. Sometimes, it is interesting to develop sample scenarios, environments, or student needs and have participants consider what elements can be redesigned or changed in a way that would increase inclusiveness for all. To gain more ideas, check out the easy-to-use and adaptable activities and resources in Inclusive: A Microsoft Design Toolkit.

HOW-TO STRATEGIES:
Spread the Word

Designed to build deeper understanding and inspire action, the strategies in this chapter focus on helping team members gain a deep understanding of the larger call to action around creating an inclusive maker culture. Taking a strategic approach with all stakeholders provides consistency in how maker and design resources are perceived and used.

STRATEGY 5.1: MAKER LEARNING AND UDL CARD SORT

DURATION OF ACTIVITY: 25–40 minutes

RECOMMENDED NUMBER OF PEOPLE: 1 or more

WHAT YOU'LL NEED:

- Cards with examples or scenarios of UDL-inspired maker learning experiences and uses of the makerspaces (Scan the Chapter 5 Resources QR code for sample cards.)
- Answer key for sort (Scan the QR code for an example.)

The purpose of card sorting is to provide educators with examples of the UDL principles of Representation, Engagement, Action, and Expression within the maker learning process and while using a makerspace or its resources. This activity is a powerful way to familiarize participants with the vocabulary of the UDL Guidelines. The learning takes place when educators engage in dialogue and must evaluate which description or example fits into which UDL principle. Sample cards with descriptions of what the UDL Guidelines and checkpoints look like in action during maker learning are provided. Aim for 30–100 example cards; too few is too simple, too many is overwhelming.

WHEN TO USE

ALIGNED ISTE STANDARDS FOR EDUCATORS

- Collaborator, 4a
- Learner, 1a

The Maker Learning and UDL Card Sort activity is best to try when participants have already engaged in foundational learning about what inclusive maker learning is and why accessibility with this type of learning is valuable. It is also helpful for participants to already have an awareness of the UDL Guidelines, so consider providing a copy of the Guidelines to reference while they engage in the card sort activity. Encourage participants to engage in dialogue about why they believe each of the cards fits with a specific principle. I've found it helpful to encourage participants to look for key terms in the scenarios that relate to the overarching UDL principles.

GO REMOTE

It may seem tricky to engage participants in this very physical activity in a virtual environment. To help facilitate this activity in a virtual environment, the following tools and processes provide options for allowing participants to move ideas around while evaluating connections to the UDL Guidelines.

- Create cards in Google Draw so that participants can easily sort the ideas while using a collaborative document in Google Docs or Google Slides.
- Create the categories and cards in Padlet or Google Jamboard, and allow participants to sort their ideas in the app.
- Provide participants a list of the statements that are on the cards. This can be helpful because it provides participants with more ways to perceive the details on the cards and to refresh their memories.
- Try an online tool for card sorting: The Card Sort Tool from UXtweak (**UXtweak.com/card-sort-tool**) offers the ability to record a session and allows participants to sort cards into specific categories, as well as label their own categories in open card sorts.

WHAT TO DO

STEP 1: Provide participants with the cards describing scenarios and examples (Figure 5.1). Explain the three UDL principles they will use for sorting categories.

STEP 2: Ask participants to work collaboratively in groups of three to five individuals to review each scenario or example on the cards. Then have participants evaluate which UDL principle the example or scenario fits. It is likely that some participants will see how the example could actually fit more than one principle (Representation, Engagement, Action, and Expression). This is okay. The goal is to prime educators to consider what it really can look like to design makerspaces and learning experiences that incorporate different methods for representation, engagement, action, and expression of learning.

STEP 3: Provide time for participants to self-assess their categorizations. Provide participants with an answer key that they can use to reflect on their categorization and card sorting. Remember, this isn't about having perfect responses, so reassure participants that they may see multiple category fits.

Figure 5.1 Provide each group of participants with categories to sort their cards into. Having different sets of the Card Sort cards in different colors per group can help with organization.

STRATEGY 5.2: CAMPFIRE

DURATION OF ACTIVITY: 20–30 minutes

RECOMMENDED NUMBER OF PEOPLE: Large groups

WHAT YOU'LL NEED:

- Cards with key terms or concepts that pertain to maker learning, inclusion, and makerspaces that people will have had some familiarity and experience with (Scan the chapter's QR code for samples.)
- A place where cards can be posted for all to see ahead of time, such as a wall

The goal of this activity is to allow colleagues to learn from others' past experiences through storytelling.

ALIGNED ISTE STANDARDS FOR EDUCATORS

- Leader, 2c
- Collaborator, 4c

WHEN TO USE

The Campfire strategy is a powerful way to use the experiences of Maker Champions and other early adopters to teach others. It works best with large groups, which increase the likelihood of different experiences and findings being shared. Make sure, however, that participants know that they don't have to be a seasoned maker expert to share an insightful story for others to learn from. Arrange the room in a campfire-like semicircle, and prepare a list of the terms that participants can review from their seat. You could even create a fun and relaxed atmosphere by embracing the campfire theme: Play a crackling fire video or cricket sounds in the background, encourage participants to wear flannel, and serve s'mores bars.

WHAT TO DO

STEP 1: Arrange the room in a circular or semicircle campfire-like setup.

STEP 2: Provide all participants with an individual list of terms that match the cards posted on the wall (or other space all can see). I recommend thinking about this like a T-chart: One side has all the terms on the wall, while the other side is empty.

STEP 3: Volunteers opt in, choose one card from the wall, and read it aloud. They then tell an introductory story about their experiences. Some key questions participants should consider when sharing about the selected topic include:

- What did you do?
- What went well that others should replicate?
- What would you recommend that other teachers do or not do?
- What impact did it have on students?

STEP 4: After sharing the story, participants then place the card on the opposite side of the T-chart (Figure 5.2). Have a Maker Champion kick off this activity by sharing first so that colleagues can see the process modeled and gain confidence.

Figure 5.2 Organize the room so all participants can view the list of terms at the front, and provide each participant with their own list of terms to reference. Being able to move cards from one side to another also helps participants keep track of which topics have been covered and which stories have already been told.

GO REMOTE

- This strategy works well in a whole-group videoconference setting. Use digital whiteboards to post and move the terms around or signify which ones participants choose.

STRATEGY 5.3: A DAY IN THE LIFE OF A MAKER

DURATION OF ACTIVITY: 20–30 minutes

RECOMMENDED NUMBER OF PEOPLE: 2 or more

WHAT YOU'LL NEED:

- A specific UDL-aligned strategy or resource you want participants to learn about in the context of maker learning
- Educators or learners who have experience using the target UDL-aligned strategy or support who are willing to share specific experiences

The goal of this strategy is to help participants develop their understanding about maker learning and acquire insights from the experiences of others. By pairing less experienced participants with teachers or students who have experience with integrating the UDL Guidelines into maker learning experiences or environments, you create opportunities for participants to learn from and empathize with those who already have experience with inclusion and making.

ALIGNED ISTE STANDARDS FOR EDUCATORS

- Designer, 5a
- Analyst, 7a

WHEN TO USE

The A Day in the Life of a Maker strategy is best to use when participants want to dig deeper into others' experiences with maker learning. While you can implement this strategy with a minimum of two participants, it is best to consider a wide variety of interviewees. To make the most of this strategy and build deeper understanding,

GO REMOTE

- Use whole-group videoconferencing to conduct the interview, and then have participants use breakout room features to do Steps 4–6.
- Participants can create digital storyboards using Comic Life, Pages, Adobe Spark, or any tool that supports image or PDF annotation.

incorporate perspectives from students as well as teachers and encourage interviews to focus on a specific instructional strategy or resource.

WHAT TO DO

STEP 1: Introduce the interviewee and a specific UDL-aligned maker strategy that participants will be exploring through an interview.

STEP 2: Outline descriptive questions that can help the participants gain a deeper understanding of the use and impact of the specific UDL-aligned resource or strategy.

STEP 3: Have participants conduct the interview while jotting down their observations and key takeaways. Encourage participants to focus on all different parts of the activity, key outcomes, and interviewee reflections. To increase accessibility, record the interview via video and/or audio. Doing so will provide options for using transcription and closed captioning tools, as well as make revisiting parts of the interview easier for participants.

STEP 4: Have participants share their observations with a partner and then invite individuals to share with the whole group. To provide opportunities for learners to gain confidence and increase the chance of total participation, incorporate the Ripple Effect, which is the process of asking all participants to construct a response that they share and confer with a peer and then providing opportunities for whole group share out (Himmele & Himmele, 2017).

STEP 5: After sharing observations, pair participants to outline together the key perspectives, takeaways, and tips provided by the interviewees.

STEP 6: Ask the participant pairs to construct an artifact that captures what an ideal implementation of their specific strategy would entail. One option would be

for participants to create a storyboard that illustrates what an ideal interview with a learner would look and sound like. Be sure to provide participants a choice for the medium with which they would like to demonstrate their learning. To expand participants' opportunities for personalization, suggest using digital tools for podcasting, video creation, modeling, coding, or 3D or graphic design to demonstrate understanding.

STRATEGY 5.4: FILLING IN THE GAPS

DURATION OF ACTIVITY: 30–45 minutes

RECOMMENDED NUMBER OF PEOPLE: 3 or more

WHAT YOU'LL NEED:

- A dedicated space for participants to share their ideas that other participants are able to access
- Sticky notes (paper and/or digital)

The purpose of this strategy is to produce an account of what a powerful maker learning experience entails in order to gain deeper understanding and clarity about what inclusive maker learning looks like in action, and to assist participants in understanding the value that intentional, inclusive maker learning offers.

ALIGNED ISTE STANDARDS FOR EDUCATORS

- Citizen, 3a
- Analyst, 7a

WHEN TO USE

The Filling In the Gaps strategy is best to use when you want participants to gain insights and review data related to high-impact, inclusive maker learning. Due to the collaborative nature of this activity, it is best to include as many participants and perspectives as possible. The more people you include, the more likely you are to identify potential gaps.

GO REMOTE

- Tools to create a digital storyboard include Comic Life, Pages, or any annotation tool that allows participants to download an image or PDF of a storyboard and annotate it. For instance, Adobe Spark is great for creating highly visual representations.
- iMovie Trailers can offer options for adding authentic imagery and filling in key details in the subtitles of the iMovie template.
- Clips provides an alternative way to engage in this activity. With this iOS-based app, participants can create short video clips to illustrate and visualize what they consider to be an example of high-impact maker learning.

WHAT TO DO

STEP 1: Instruct participants to create a list of insights they have about maker learning.

STEP 2: Instruct participants to repeat this process, making a list of insights or takeaways from the UDL Guidelines.

STEP 3: Ask participants to create an artifact that visualizes these key insights in action (Figure 5.3). No matter what type of product participants choose to create to communicate and visualize their key takeaways, the artifact needs to:

- Identify the key idea or concept
- Include a diagram, photo, or collage
- Provide a short description or sample dialogue of what the key concept or insight would look like in action

For example, participants could create a hand-drawn or digital storyboard. (Templates are available from Google Drive Templates.) Alternatives to traditional storyboarding include using Padlet's Timeline format or graphic design tools such as Canva.

STEP 5: Leave a blank scene box or space for the insights you would like to improve or learn more about.

STEP 6: Focus on the blank scene boxes to generate ideas.

STEP 7: Have participants share and review each other's work. Invite participants to add additional ideas.

Figure 5.3 Participants can create visualizations of their key takeaways that are digital or physical.

STRATEGY 5.5: ASSUMPTION BUSTING

DURATION OF ACTIVITY: 40 minutes or more

RECOMMENDED NUMBER OF PEOPLE: 6 or more

WHAT YOU'LL NEED:

- Space to share your ideas so all can see
- Sticky notes (paper and/or digital), collaborative documents, or whiteboard tools

The intention of this strategy is to identify assumptions that stakeholders (administrators, teachers, students, parents, and so on) may have about maker learning and reject or confirm them.

ALIGNED ISTE STANDARDS FOR EDUCATORS

- Collaborator, 4d

GO REMOTE

- Gather the list of assumptions and questions in one session or prior to the session. Google Forms and survey tools are helpful for creating more flexibility. Encourage participants to contribute to and share their lists in a place that is easy for other participants to access.
- Provide opportunities for those who listed the assumptions to listen to the reflections of other participants. One way to do this is to have Maker Champions and other relevant stakeholders create video or audio interview snippets of their responses to the assumptions or questions posed. In addition to making this easier to share, it is also a way to conduct these interviews and gather stakeholder experiences asynchronously. These interview samples can be shared during the real-time meeting, or they can be used to implement this strategy asynchronously. To facilitate capturing these interviewee/stakeholder snippets, try having participants post them to Flipgrid. Others can then watch the videos on the platform and add comments on the interview responses.

WHEN TO USE

The Assumption Busting strategy is best to use after introducing the vision of maker learning and is powerful for helping participants consider what elements do and do not fit the criteria of inclusive maker learning. Because this strategy requires participants to list assumptions they hold, the more diverse the participation group the better.

WHAT TO DO

STEP 1: Have participants work collaboratively in small groups to make a list of ten assumptions they have about maker learning.

STEP 2: Rewrite each assumption as a question.

STEP 3: Elaborate on the question with three options for possible solutions or answers.

STEP 4: Ask at least six people involved in maker learning, such as Maker Champions and their students, to share their perspectives and responses to the questions.

STEP 5: Ask all participants to compare their initial assumptions to the direct experience and perspectives shared by the Maker Champions and their students.

STEP 6: Encourage participants to summarize how this process confirmed or challenged their initial assumptions or gave them new insights.

Next Steps

Chapter 5 Resources

- Develop strategies and opportunities to introduce inclusive maker learning to the larger school community.
- Build educator capacity and awareness around the Universal Design for Learning principles and how they can be leveraged when planning maker learning experiences.
- Highlight the inclusive vision of maker learning and provide basic entry points into the work.
- Maximize teacher and student success stories and experiences.
- Create opportunities for educators to engage in hands-on skill development in the areas of design and computational thinking.
- Formulate ways to capture and assess stakeholders' current state of understanding during the launch of inclusive maker learning. Use this data to address gaps and misconceptions or to develop professional learning offerings.
- Scan the Chapter 5 Resources QR code to check out useful links, templates, and resources for this chapter.

Reflection

After reading Chapter 5, take some time to consider how its ideas apply within your context using the questions below.

- How can you work within your school system's different levels of leadership to provide introductory and skill-building experiences to a wide range of educators?
- What methods can you use to capture and make use of successful inclusive maker learning experiences and reflections that are already taking place within your school system?
- What are potential assumptions stakeholders may hold about inclusive maker learning? How might you work to anticipate and address these assumptions?
- Where might staff struggle and excel in applying the Universal Design for Learning principles?