



The CSCCE Community Participation Model - part three

Scaffolding to lower barriers to participation in STEM communities

Lou Woodley, Katie Pratt, and Camille Santistevan, Center for Scientific Collaboration and Community Engagement (CSCCE)



Table of Contents

Acknowledgements	2
Citing and reusing this guide	2
About CSCCE	3
Note from the authors	3
Introduction	4
A recap of the CSCCE Community Participation Model	4
What is scaffolding?	5
A metaphor about community to explain why scaffolding is important	6
What does scaffolding look like in a STEM community?	7
Relating scaffolding to the CSCCE Community Participation Model	9
FAQs	10
Isn't scaffolding just another way of describing documentation?	10
How is scaffolding different from programming?	10
How do I work out what scaffolding to make? Where should I start?	10
Do I really need to invest time in creating scaffolding?	11
How do I keep scaffolding up-to-date?	11
Is some scaffolding more complex than others?	12
The term scaffolding is used in learning theory - how does this relate?	12
Additional reading and resources	13

Acknowledgements

CSCCE uses the CREDiT contributor roles taxonomy to show how the authors listed contributed to the creation of this guide:

LOU WOODLEY - Conceptualization, Supervision, Writing - Original draft preparation, Writing - Reviewing and Editing

KATIE PRATT - Conceptualization, Writing - Original draft preparation, Writing - Reviewing and Editing, Visualization

CAMILLE SANTISTEVAN - Conceptualization, Writing - Original draft preparation, Writing - Reviewing and Editing

We are grateful to the following members of the CSCCE community of practice for reading and offering feedback on this document ahead of publication: Chiara Bertipaglia, Emily Lescak, and Elisha Wood-Charlson.

Citing and reusing this guide

CITATION AND REUSE

“The CSCCE Community Participation Model - Scaffolding to lower barriers to participation in STEM communities” by Lou Woodley, Katie Pratt, and Camille Santistevan is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives International 4.0 ([CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)) license.

You may reshare the document in its current form only.

Cite as: Center for Scientific Collaboration and Community Engagement. (2022) The CSCCE Community Participation Model - Scaffolding to lower barriers to participation in STEM communities. Woodley, Pratt, and Santistevan doi: [10.5281/zenodo.6078934](https://doi.org/10.5281/zenodo.6078934)

Contact the CSCCE for other permissions by emailing info@cscce.org. The CSCCE logo is a trademark of CSCCE.

Last updated February 2022

About CSCCE

The Center for Scientific Collaboration and Community Engagement (CSCCE) champions the importance of human infrastructure for effective collaboration in STEM. We provide training and support for the people who make scientific collaborations succeed at scale - and we research the impact of these emerging roles.

We are available to work with you as consultants, helping you build the necessary scaffolding to support your community, perform member research, and develop engagement plans that meet your members where they are.

You can find more about our work [on our website](#), or send inquiries to info@cscce.org.

Note from the authors

In [part one of the CSCCE Community Participation Model \(CPM\) guidebook](#), we outlined our model for describing member engagement in STEM communities - the domain on which CSCCE focuses. In [part two, we focused on the role of community champions](#), emergent leaders who take on additional roles within the community to ensure its maintenance, growth, and evolution. This third and final section shines a light on the importance of scaffolding: the documentation and other supportive activities that enable all members to access and participate in a community.

Since releasing the first two parts of the guidebook, we've heard from multiple community managers across the STEM ecosystem who have been using the CPM to guide their strategic planning, rethink their programming, or support the emergent leaders in their communities by recognizing them as community champions. As part of our mission is to provide community management resources and frameworks that broker a shared language *and* that are readily actionable, it is heartening to know that we are having an impact. Please keep sending your feedback and reflections - we love to hear from you!

We hope that with this final section of the CPM guidebook, you have everything you need to be more strategic and supportive about your community programming. But, if there are additional related resources that you would find helpful, please let us know by emailing info@cscce.org.

Introduction

A recap of the CSCCE Community Participation Model

The CSCCE CPM describes four modes of member engagement that can occur within a community - CONVEY/CONSUME, CONTRIBUTE, COLLABORATE and CO-CREATE, and a fifth meta-mode, CHAMPION, indicated by the bi-directional gradient arrow beneath the other modes in figure 1.

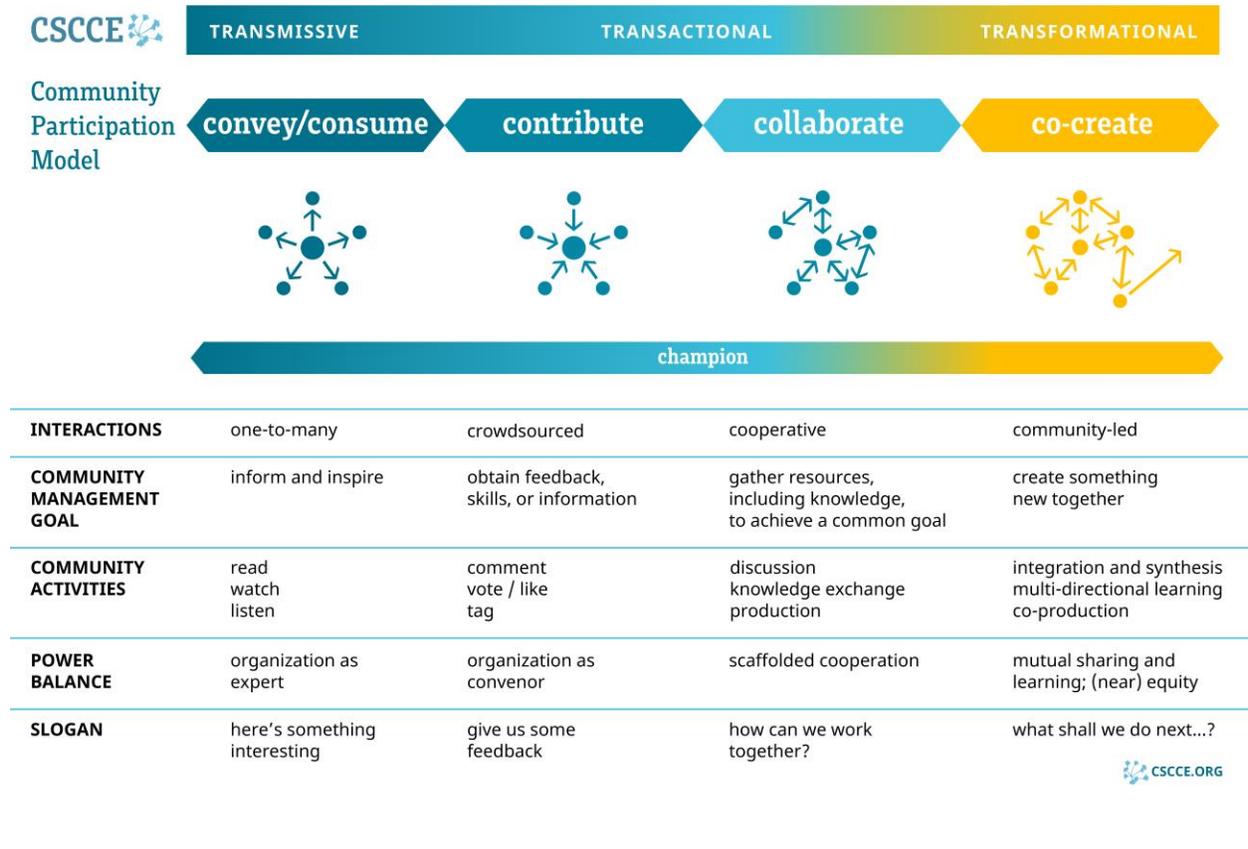


Figure 1
 The CSCCE Community Participation Model describes four modes of community member participation, CONVEY/CONSUME, CONTRIBUTE, COLLABORATE, and CO-CREATE, as well as a fifth “super user” mode, the CHAMPION mode. Member activities are generally convened or scaffolded by a community manager, who usually represents an organization or institution. Woodley and Pratt (2020) doi:10.5281/zenodo.3997802

Recapping from [our first guidebook](#):

Each of the first four modes in the CSCCE CPM describes the manner in which community members interact with one another WITHIN the community.

CONVEY/CONSUME - groups usually begin in this phase, with a community manager or communications professional CONVEYing information for members to CONSUME independently of one another. This might look like a regular newsletter to an email list, social media posts to followers, or other broadcast communications.

CONTRIBUTE - in this mode, members are empowered to CONTRIBUTE in some way. Often these contributions are invited or facilitated by a community manager, especially in the early stages of a community, and might include presenting during a webinar, writing a guest blog post, or sharing resources on a community platform. One function of the contribute mode is to enable members to discover the skills and interests of others in the group by making knowledge more visible.

COLLABORATE - in this mode, members of a community COLLABORATE with one another, often without needing an explicit invitation from the community manager. Such collaborations might include co-authoring a white paper or blog post and may involve infrastructure created or maintained by the community manager, but used more independently by community members. For example, there may be general guidelines for writing a guest blog post that the community manager has created, but co-authors work together without the community manager to write the post.

CO-CREATE - most common within established communities, this mode describes how members work together WITHIN the community to CO-CREATE something that they couldn't do before. For example, community members might organize an event together, form working groups to push the work of the community forward, or establish new communication channels such as a podcast.

In addition to the four modes that describe member interactions within the community, there is a fifth mode that describes a meta-level of engagement:

CHAMPION - the champion mode is when a community member is motivated to take on more responsibility for the success, sustainability, and/or running of the community. This might look like advocating for the community on social media, running a working group or local chapter, or taking the lead in creating and maintaining documentation to support the community.

However, sometimes designing programming to nurture engagement in the different modes isn't enough. There can be a range of barriers to participation (e.g., adoption of new tools) or a limitation to the number of ways in which members can get involved (e.g., synchronous and/or in-person events). This is where scaffolding comes in.

What is scaffolding?

While many communities have regular programming such as monthly community webinars, working group meetings, and an annual meeting or symposium, programming alone is often insufficient to support the maximal engagement of new members, or to support all members in feeling confident and included. Feelings of disengagement or exclusion can arise due to i) a lack of **information**, e.g., being unaware of the ways in which to engage, ii) a lack of **technical support**, e.g., not knowing how to use an unfamiliar communication platform, or iii) a reduced **sense of belonging**, e.g., feeling unable to share their specific needs or to express aspects of their identity.

Scaffolding is a nuanced but important way of nurturing inclusive communities. We define scaffolding as the supportive information, activities, and processes that address barriers to member participation and ensure that all members can access and engage in community programming.

Scaffolding is the supportive information, activities, and processes that address barriers to member participation and ensure that all members can access and engage in community programming.

Scaffolding serves two key purposes:

1. **It lowers barriers to participation** - which may be informational, technical, or related to a sense of belonging
2. **It supports multi-modal participation** (i.e., engagement in multiple modes of the CSCCE CPM)

We like to use the word scaffolding because:

- It implies a **supportive guide that helps others feel safer, and clearer** about how they might engage within a specific context.
- It's typically **intended to support member growth** (in confidence, engagement, and commitment with the community) although it does not make the growth happen in and of itself. That requires members to engage.
- It **can be removed and remodeled** - it's not intended to be a permanent fixture in a single, rigid configuration and might be removed or reworked into new formats, depending on needs.
- It is **modular and can be combined with other scaffolding units** to form higher order supporting structures (e.g., combined into a playbook) or to support multiple pieces of community programming at once.

Scaffolding can sometimes be overlooked because the everyday functioning of a community may continue in its absence - programming and other community activities may occur without scaffolding. **But scaffolding is essential to the health of the community.** By ensuring that everyone has everything they need to access and engage with the community, scaffolding makes it easier for the community manager to support the different needs of members so that they feel a sense of belonging. When used strategically, scaffolding can also support members in getting more involved in community programming by progressing from the modes on the left of the CPM to those on the right.

A metaphor about community to explain why scaffolding is important

We often use the metaphor of a house party to explain community management and to work through some of the challenges in a relatable way. It goes a bit like this...

You, the community manager, are hosting a house party (aka supporting members on your community platform). It is your job to ensure that all of the guests at the party enjoy themselves - in a way that is inclusive, safe, and respects the neighbors! This starts with the invitation (onboarding), which should be clear and engaging and include information about expectations and norms (community participation

guidelines). You may also require an RSVP to your invite that includes learning more about your invitees' needs (onboarding survey).

At your party, you might welcome your guests at the door and introduce them to others (onboarding and initial welcome) or you might ask other guests to take turns in doing this. Later, you might invite your guests to take part in a game or to play their favorite song (programming), which helps them get to know one another and start identifying shared interests. You will probably also offer refreshments and mingle with your guests yourself (informal coffee chats). And after your party ends, you might check in with your guests about whether they had fun or not (a community survey).

The best house parties seem to happen seamlessly - the refreshments are replenished before you realize they have run low, the activities are engaging but not overwhelming, you meet a lot of interesting people, you feel safe and welcome in the space - and you can even find key facilities such as the restrooms! This is very likely because your host put a lot of thought into all the supporting structures ahead of time - what we refer to as scaffolding.

In the house party metaphor, scaffolding might include:

- requesting information about dietary restrictions as part of the RSVP process
- providing information related to accessibility such as parking availability, access to elevators
- placing balloons outside the door to indicate that the guests are in the correct location
- creating name badges for attendees with options for them to self-disclose pronouns or other personal information
- greeting guests at the door and introducing them to at least one other attendee they don't already know
- adding a sign on the wall indicating the location of the toilets
- posting food allergy information next to items at the buffet

We'll likely come back to this house party metaphor in future publications, as in our experience it has proven useful in discussions about code of conduct implementation, member-generated content, and more.

What does scaffolding look like in a STEM community?

Just as in the house party metaphor described above, scaffolding in a STEM community is intended to put members at ease and aid their active participation. Table 1 outlines some common examples of scaffolding for a community of practice with a community manager (or team) responsible for its programming. The table also explains how each piece of scaffolding relates to programming in the CPM, and where possible, includes a link to a resource we have created (shared under a CC BY 4.0 license) that you can use as a template, with attribution.

Scaffolding	Who it's for	Example	What this supports	CSCCE reusable resource
New member welcome tip sheet	New members	A short PDF document outlining key community activities, contacts and channels.	<p>Lowers the informational barriers to participation by helping new members to find key information in one place.</p> <p>Supports participation in multiple modes by describing current community activities.</p>	Welcome to the CSCCE community of practice! A tipsheet for new members. doi: 10.5281/zenodo.4161781
Onboarding survey	New members	A short survey to determine the needs of new members and ways in which they might like to contribute.	<p>Lowers the barrier to participation by nurturing a sense of belonging. Enables a new member to express their needs and preferences from an early stage.</p> <p>Supports participation in multiple modes by helping the community manager learn about member interests and design programming and invitations to participate accordingly.</p>	CSCCE community welcome survey. doi: 10.5281/zenodo.6091989
Welcome call	New members	A 30-minute optional call with the community manager so the new member can ask specific questions in a more personalized way.	<p>Lowers the barrier to participation by nurturing a sense of belonging. Creates a safer space to share needs in a one-on-one situation.</p> <p>Supports participation in multiple modes by helping new members understand how they might participate in the community.</p>	CSCCE does not have a reusable resource related to hosting a welcome call, but we do offer this as part of our initial onboarding email to new members. We typically ask about the member's specific interests, what they might need from the community at this time, and whether they have any questions so far.
Technical platform set up guide	Any member unfamiliar with the tech platform or whom would benefit from tips specific to this community	A downloadable PDF with screenshots and instructions describing how to avoid common pain points, e.g., how to configure notifications and customize dashboard / home page views.	<p>Lowers the technical barrier to participation by making it easier to use the community platform in a way that matches the member's needs, e.g., by reducing the frequency of notifications.</p> <p>May be reused by community CHAMPIONS to lower barriers to participation in special interest groups that they lead.</p>	Slack quick start guide. doi: 10.5281/zenodo.3763729
Community participation guidelines	All members	A web page outlining the expected behaviors for community members and how to report inappropriate behavior.	<p>Lowers barriers to participation by creating safer spaces across the community where all members feel they belong. Aligns members' expectations about acceptable behaviors within the community.</p>	You can view the CSCCE community participation guidelines on the CSCCE website . You can read about how the guidelines were created with the code of conduct working group here .

Resources folder for special interest group co-chairs	Special interest group co-chairs	A Google Drive folder pre-populated with materials such as slide templates, a virtual note-taking template and tips for group organization.	<p>Lowers the technical and informational barriers to participation for members seeking to take on emergent leadership roles (CHAMPION).</p> <p>Helps CHAMPIONS lower barriers to participation in a special interest group by CONVEYing information in a clear, consistent manner.</p> <p>This may support members engaging in multiple modes.</p>	CSCCE start up guide for special interest group leads. doi: 10.5281/zenodo.3973255
Member recruitment pamphlet	Community champions wishing to recruit new members from their own networks	A short PDF brochure describing the specific nature of the community, its programming and the benefits of joining - as well as how to do so.	Lowers the informational barriers to participation by supporting CHAMPIONS in CONVEYing information to potential new members.	CSCCE created a pamphlet for special interest group chairs to send to prospective members (available on request).

Table 1

Examples of scaffolding, its role in member engagement, and CC BY templates you can use to create scaffolding in your community.

Relating scaffolding to the CSCCE Community Participation Model

Much of the scaffolding we’ve identified in communities supports members in entering the CONTRIBUTE mode of engagement, where they are actively participating in the community rather than more passively engaging with materials and information in the CONSUME mode. By providing this scaffolding early on in the member’s involvement with the community, the intention is to move them into the more active modes of engagement sooner. This is especially important in communities that need to reach COLLABORATE AND CO-CREATE modes to meet their goals because a majority of members in CONVEY/CONSUME mode are unlikely to move to generating collective value on their own.

Indeed, scaffolding can be useful to aid the transition between all modes of the CPM and shouldn’t be overlooked at these transition points. For example, a well-prepared virtual notes document with an agenda, activity instructions, and key links can help a group to quickly move into the COLLABORATE mode during a call rather than getting stuck in CONTRIBUTE mode with the community manager needing to facilitate every interaction.

The transition from COLLABORATE to CO-CREATE is somewhat more subtle in that it relies on the community manager assuming a less visible role; instead of directing a project, the community manager holds space for members to explore their uncertainties around a problem and come up with solutions. Here, scaffolding could look like in-the-moment temperature checks to gauge comfort levels with progress so far (e.g., using a Zoom poll or show of emojis) or using a whiteboard tool to gather concerns. These timely and responsive actions serve to recenter different voices if some

members start to disengage or the group begins to fragment.

It's also worth noting that effective scaffolding serves to create trust within a community by setting norms and boundaries for community members. The way that scaffolding is presented, applied, and iterated can have a big impact in showing a shared commitment to transparency, responsiveness to challenges that arise, and engaging in dialogue to find solutions. Over time, this cumulative impact of scaffolding across multiple modes of the CPM can help members feel empowered to CO-CREATE; a mode of engagement that relies on brokering a shared understanding of a project's goals and how to achieve them - and the ability to negotiate and move through conflict and uncertainty together.

Finally, scaffolding is also important in supporting emergent leaders in taking on additional responsibilities within and on behalf of the community, such as running a special interest group or recruiting new members to the community (CHAMPION mode). For example, community managers can create a resource folder to assist special interest group co-chairs so that co-chairs can focus on the group's programming rather than recreating existing scaffolding from scratch.

FAQs

Isn't scaffolding just another way of describing documentation?

No. We think of scaffolding as being more than just documentation - although some scaffolding may take the form of documentation. Scaffolding can also look like surveys, welcome calls, pre-event interviews, interactive playbooks, and more.

How is scaffolding different from programming?

Programming is the combination of activities that take place in a community that support members in realizing the community's purpose together. Programming might include a monthly community call to share perspectives, a weekly report out session to highlight progress and troubleshoot difficulties, or regular working group meetings to create new outputs together.

Scaffolding may be used to *support* a specific item of programming (e.g., a tip sheet explaining how to prepare a presentation for a monthly community call or a welcome pack to support new working group members in becoming active in the group), but its goal is to lower the barrier to participation in the programming and/or to offer multiple modes through which one can participate, rather than to specifically and directly advance the community's mission via an activity.

How do I work out what scaffolding to make? Where should I start?

You could create a huge range of different scaffolding for your community members, but there's no need to try to do this all at once or to think you have to do it all yourself!

There are often two good places to start. Firstly, ask which activity or behavior you are most interested in supporting in your community right now. If you're a new community, that might be welcoming new members and ensuring they can start using your community platform. If you're an established community, it might look like providing more support for burned out working group chairs so that they can focus on running their group more efficiently.

Secondly - and relatedly - what are your community members regularly asking you about? Or where do members consistently seem to be encountering problems or getting confused? For example, if no one can find the meeting notes from a working group, maybe a tip sheet of key information for new working group members which is pinned to the top of the shared online space and/or emailed to new members could help to clarify this.

Do I really need to invest time in creating scaffolding?

As described above, you *could* decide to run the community or a specific activity without related scaffolding, but this might not lead to the desired levels of engagement, or might under-serve specific member types such as new members, or those who feel less sure about how to contribute, e.g., because they are unfamiliar with a tool or process or are most likely to be impacted by existing power dynamics.

The absence of scaffolding may save time in the short term by reducing the time spent creating documentation or welcoming community members. But, as a community manager, you need to assess where omitting scaffolding is ok for now, and where a lack of scaffolding is creating a barrier to engagement that is adversely affecting the community in a significant way such as reducing overall community health.

It's also worth noting that while scaffolding may seem daunting to create at first, it will ultimately save you time as a community manager because you'll be pre-empting members' needs and empowering them to take action without your input. This will free you up to move on from answering the same question multiple times and instead to focus on higher level strategic and programmatic tasks.

How do I keep scaffolding up-to-date?

As with any supporting information and activities, you need to keep scaffolding up-to-date! One way of doing this is to schedule regular scaffolding review sessions (ideally every 6-12 months) where you mark out dedicated time to review your processes and supporting materials.

You may also periodically need to create new scaffolding. As members engage in new activities and/or modes of engagement, new needs might arise. As a community manager you'll need to stay responsive to emerging challenges and you may wish to create mechanisms for members to make scaffolding requests directly to you.

You may be in a position to engage community members in helping you to update scaffolding. This can often feel less onerous to busy members than creating new materials from scratch and, if you

decide to publish your materials (and maybe also license them for reuse as we do at CSCCE - see Table 1), members could receive authorship credit for a citable publication. This has the additional benefit of socializing the adoption of the scaffolding because members have been directly involved in its creation.

If you have an annual meeting, hackathon or other regular event, you might consider hosting a workshop where members can give feedback on and contribute to updating scaffolding. In return, they get to meet other members and perhaps socialize together after the work is done!

Is some scaffolding more complex than others?

Yes, we think of scaffolding as being somewhat modular in that some items of scaffolding can be combined with others to create higher order scaffolding structures. For example, you might have various standalone documentation and activities as part of your onboarding of new members, and these may live on your website as individual pages, but you might also package them up into a new member welcome pack that each member receives on joining.

A similar higher order scaffolding example is a community playbook - which can be intended to support specific audiences ranging from community staff to community members or community champions. Additional resources about community playbooks will be forthcoming.

The term scaffolding is used in learning theory - how does this relate?

If you have a background in teaching, you may recognize the term *scaffolding* from learning theory. Educators use the term to describe how teachers support students in becoming increasingly self-guided learners. This involves first understanding where learners are at and then crafting opportunities for them to expand the boundaries of their current skills. These opportunities slowly move from being mostly instructor-led to student-led. For example, a lesson might first involve a demonstration by the teacher, followed by a group project where learners apply a new skill together. Finally, learners complete an independent activity that involves using the new skill (see article linked in the additional reading and resources section).

There are some similarities to how we're applying the concept to the realm of scientific community management. In our case, we are interested in how community managers can create supportive materials that help members become more engaged in community activities as they move across the CPM, including co-creating (and learning!) together. This requires awareness of members' interests, capacities and capabilities and then providing resources that makes participation easier and relevant to members' needs.

Additional reading and resources

- Center for Scientific Collaboration and Community Engagement (2020) The CSCCE Community Participation Model – A framework to describe member engagement and information flow in STEM communities. Woodley and Pratt doi: [10.5281/zenodo.3997802](https://doi.org/10.5281/zenodo.3997802)
- Center for Scientific Collaboration and Community Engagement. (2021) The CSCCE Community Participation Model - Exploring the Champion mode. Woodley and Pratt doi: [10.5281/zenodo.5275270](https://doi.org/10.5281/zenodo.5275270)
- [The importance of instructional scaffolding](#). An article in *Teacher Magazine* by Dawn Castagno-Dysart, Bryan Matera, and Joel Traver that provides an overview of how educators use scaffolding.