Going to Scale with Online Professional Development:

The Friday Institute MOOCs for Educators (MOOC-Ed) Initiative

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Abstract

The Friday Institute’s Massive Open Online Courses for Educators (MOOC-Eds) initiative builds upon our prior work designing, implementing and researching small cohort, facilitated online workshops through the EDC EdTech Leaders Online program and online professional learning communities, cohorts, and courses at the Friday Institute. This initiative was designed to explore whether MOOC-like approaches could be adapted to:

• Address the professional development needs of many educators—teachers, instructional coaches, and school and district administrators;

• Incorporate research-based principles of effective professional development;

• Provide scalable, accessible, cost-effective professional development.

Beginning in 2012, we launched a set of MOOC-Eds for district and school leaders and educators. These MOOC-Eds build upon four major design principles that reflect research-based practices for educators’ professional learning: multiple voices, self-directed learning, peer-supported learning and job-connected learning. We then developed *instructional elements*—specific things that participants use and do—that instantiate these principles in the courses. We have an active research program, using the extensive data available to explore participants’ self-directed learning paths, interaction
patterns for peer-supported learning, the value of different types of resources and activities, and the impact of MOOC-Eds on participants’ knowledge and practices. This chapter will summarize what we have done and learned so far, with an emphasis on design principles and how they are incorporated into specific instructional elements within the MOOC-Eds.

**Introduction**

The importance of effective professional development (PD) stems from the many changes in schools and demands placed on educators, as well as the reality that many educators do not have access to the PD that they want and need. In the past few years alone, educators have been facing changes in curriculum standards, student assessments, expectations for the uses of technology and the personalization of learning, diversity of students’ cultural and linguistic backgrounds, and teacher evaluation processes, along with decreased funding leading to larger class sizes, fewer resources, and the need to make education more productive and cost-effective.

These changes raise two critical questions: (1) How can the nearly 4 million K-12 educators in the United States – teachers and administrators in public and private schools – be prepared for the rapid changes facing our education system? (2) How can the next generation of educators be prepared to teach and to lead in an education system that is far different from the one they experienced as students?

While almost all educators have access to some PD each year, over 50 percent of them express dissatisfaction with their PD opportunities, finding that it is neither relevant nor personalized (Wei, Darling-Hammond & Adamson, 2010). Effective PD is ongoing, job-embedded, and relevant to one’s professional needs, while also providing
opportunities for collaboration with peers (Darling-Hammond, Wei, Richardson & Orphanos, 2009). Some aspects of professional learning – such as coaching from more experienced educators, professional learning communities, and hands-on learning of technology tools – benefit from local person-to-person connections. However, based on our prior experience and research in online professional development, we conjectured that some professional development needs could be met by scalable, cost-effective, online learning opportunities that take advantage of current technologies—that is, by programs that use MOOC-like approaches adapted specifically for education professionals. This chapter summarizes our explorations of that hypothesis over the past two years in what we have called the MOOCs for Educators (MOOC-Ed) initiative at the Friday Institute for Educational Innovation at the NC State University College of Education.

Building on Prior Work

The authors of this chapter and the large team of educators, designers, technologists, and researchers working on the MOOC-Ed initiative, bring extensive experience that has informed our efforts, including:

- From the Edtech Leaders Online Program (ETLO) and the related eLearning for Educators project funded by U.S. Department of Education, we have solid evidence of the value of small-scale, facilitated online professional development courses and lessons learned about resources, activities and discussions that educators value (Kleiman & Treacy, 2006).
- From the eLearning for Educators project large-scale randomized control studies, we have evidence that cohort-based, facilitated online workshops can have positive
impact on teachers’ professional knowledge and practices and, in turn, on their students’ achievement (O’Dwyer, Masters, Dash, Kramer, Humez & Russsell, 2010; Dash, Kramer, O’Dwyer, Masters & Russell, 2012; Kramer, Master, O’Dwyer, Dash & Russell, 2012).

- From NSF-funded research, we have evidence that both facilitated cohort-based online courses and self-paced, individualized courses can lead to effective learning, and information about the advantages and disadvantages of each type of course (Carey, Kleiman, Russell, Veneble & Louie, 2008; Russell, Venable, Kleiman & Carey, 2009).

- From research at NC State University on online communities of practice for educators and on interaction patterns within MOOC-Ed discussions, we have learned lessons about the types of online resources, activities and discussions that educators find to be of value, and the instructional elements that support their productive engagement in online exchanges (Booth & Kellogg, 2014; Kellogg, Booth, & Oliver, 2014).

**MOOC-Ed Design Principles**

We set out to explore developing online professional learning experiences that were related to other MOOCs in that they serve large numbers of educators (although not nearly as large as some MOOCs), are open to all interested participants, are delivered online, and are structured like a course to provide content and activities in defined time periods. However, the Friday Institute MOOC-Eds have a set of characteristics that make them different from MOOCs designed for other audiences and purposes:
• The MOOC-Eds are designed to help adult educators meet their professional learning needs, so we assume that participants are literate, motivated, and self-directed learners.

• We value the experience and expertise of the participants and design ways in which they can share what they know and further the learning of others.

• While we do have defined requirements for participants who desire continuing education units (CEUs), we do not have grades or formal tests. Therefore, we do not have to address concerns about test security and integrity that MOOCs providing course credit have to address.

• We emphasize establishing professional connections among participants. Participants are identified in all their comments and projects; we do not allow for anonymous postings or project feedback.

• We recommend participating in the MOOC-Eds with colleagues and engaging in local discussions to relate the MOOC-Ed experience to one’s own context.

• Our focus is on participants reaching their own goals that they articulate when registering for the course, not on goals we set or on completion rates.

          Another important factor is that our approach is designed in accordance with the research-based principles of effective professional development ((Darling-Hammond, Wei, Richardson & Orphanos, 2009) and online learning (iNACOL, 2011), which we incorporate into four major design principles for MOOC-Eds:

1. **Multiple voices**, so that participants learn about the perspectives of other teachers and administrators along with those of students, researchers and experts in the field. MOOC-Eds are purposefully *not* designed around one or two experts who present
online lectures. They are about a rich set of perspectives presented within the context of activities and exchanges that reflect the additional design principles described below.

2. **Self-directed learning**, so that participants can personalize their experience by identifying their own goals, selecting among a rich array of resources, and deciding whether, when, and how to engage in discussions and activities to further their own learning and meet their goals.

3. **Peer-supported learning**, through participants engaging in online discussions, reviewing each others’ projects, rating posted ideas, recommending resources, crowdsourcing lessons learned, and participating in twitter chats and other exchanges appropriate to the individual course.

4. **Job-connected learning**, through the use of case studies, classroom and school related projects; developing action plans; and other activities that center participants’ work on critical problems of practice and data-informed decision making in their own classrooms, schools or districts.

These design principles connect well with the four major themes of this volume. Scalability and sustainability are addressed through designing MOOC-Eds for large numbers of participants at a minimal cost per person, using self-directed learning to allow individuals to personalize their own learning experiences and peer-supported learning to provide interactions without the cost of a large number of facilitators. Inclusivity is addressed through the multiple voices principle, which leads to providing alternative models and strategies from different contexts to address different participants’ needs and interests. As described below, we also address accessibility through providing multiple
options, such as video, audio and print versions of materials, when possible. Adaptability is addressed through both the self-directed learning principle, which enable participants to adapt the course to the own learning goals, paces and preferences, as well as the job-connected learning principle, which enables participants to the materials and projects to fit their own professional contexts.

We next turn to describing some of the major instructional elements we have been using to instantiate these principles in the MOOC-Eds. Then we will provide a brief overview of the research agenda through which we are exploring how participants engage in MOOC-Eds and the value to participants of the various instructional elements.

**The Friday Institute MOOC-Eds**

The table below summaries the six MOOC-Eds we have developed. Overall, at the time we prepared this chapter, we have run eight MOOC-Ed courses, with a total of 10,746 participants registered. The participants come from all 50 States and 80 other countries. All these MOOC-Eds will be offered again one or more times in 2015.

<table>
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<tr>
<th>Course Information</th>
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| **Digital Learning Transition**         | District leaders  
School Leaders  
Instructional Coaches  
Library Media Specialists  
Teacher Leaders  
Consultants | This course helps school and district leaders understand how technology and the global information age impact what students need to know and how and when student learning can take place. They study the elements of a successful digital learning transition, develop goals for digital learning aligned to student outcomes, and create an action plan for their own district, school or classroom. |
| **Partner:** Alliance for Excellent Education |                                                                                         |                                                                                                                                             |
| **Coaching Digital Learning: Cultivating a Culture of Change** | Instructional Coaches  
Library Media Specialists  
Teacher Leaders  
Providers of PD | This course is for those who provide professional development and coaching to classroom teachers in the effective uses of digital learning. Participants enhance their digital learning content knowledge and further develop their strategies for working with teachers. |
### Fraction Foundations: Helping Students Understand Fractions

**Funders:** William and Flora Hewlett Foundation, Oak Foundation

**K-8 Educators**
Teacher Educators
Providers of PD

This course helps educators teach fractions concepts and skills more effectively through understanding students' thinking and implementing research-based approaches in their classroom. It will help educators address rigorous curriculum standards for fractions, whether from the Common Core State Standards or from other up-to-date standards.

### Disciplinary Literacy for Deeper Learning

**Funder:** William and Flora Hewlett Foundation

**Grade 6 to 12**
Teachers in ELA, Science, Social Studies, History, and Mathematics
Providers of PD.
Teacher Educators.

This course explores what it means to read, write, speak, and listen for learning and creating knowledge within a discipline. It offers a Model for Inquiry-Based Disciplinary Literacy to help promote deeper learning and foster personalized application to local contexts.

### Learning Differences

**Partners:** Big Brothers Big Sisters, New Teacher Center, Oak Foundation, Teach for All, Teach for America

**Funder:** Oak Foundation

Teachers
Instructional Coaches
Library Media Specialists
Parents
Providers of PD
Teacher Educators
Administrators

This course helps teachers develop strategies that will support students who find learning in traditional classrooms to be challenging. The course considers findings from the learning sciences to help teachers understand the specifics of executive function, motivation, and working memory as a foundation for developing strategies to address the needs of their students with learning differences.

### Teaching Statistics Through Data Investigations

**Funder:** William and Flora Hewlett Foundation

Teachers of Statistics and Math (Middle School – Early College)
Teacher Educators
Providers of PD

This course enables educators to learn to use investigations to teach statistics and help students explore data to make evidence-based claims. It is designed to help teachers address the additional attention to statistics in the Common Core and other rigorous curriculum standards.

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**Instructional Elements**

Through our work designing, implementing and evaluating MOOC-Eds, we are developing a set of instructional elements that help us ensure that the principles described above are effectively incorporated into each MOOC-Ed. The instructional elements include conceptual frameworks, student scenarios, expert panels, participant projects with
peer feedback, resource collections, asynchronous discussions, twitter chats and crowd-sourcing, along with other course-specific elements that enable participants to structure their experiences and guide their own learning. While these elements are our vehicles for translating the design principles described above into MOOC-Ed materials, there is not a one-to-one mapping between principals and elements—ideally, each design element encompasses multiple principles. Figure 1 highlights the connection between the design principles and the instructional elements. We will describe selected instructional elements, provide examples of how each one has been incorporated into one or more MOOC-Eds, and summarize how each element reflects the design principles. The challenge for the designers of each MOOC-Ed is to select and organize a coherent, well-balanced set of instructional elements to instantiate all the principles while providing the flexibility required to address the different goals, contexts, roles, prior knowledge and learning preferences of the many participants.
Conceptual Frameworks

Conceptual frameworks provided within each MOOC-Ed help participants see the big picture and understand the structure of the course so that they can better guide their own learning. The frameworks also help participants bridge what they are learning about research and practice and provide a common language to help participants communicate.
about key ideas. These frameworks vary to reflect the goals, content and audience of the MOOC-Ed, as described in the two examples below.

The Digital Learning Transition MOOC-Ed uses a framework developed in collaboration with the Alliance for Excellent Education’s Project 24 Initiative and shown in Figure 2. This framework describes seven key elements to be address in a digital learning plan. The circle around these elements summarize the iterative planning process. At the center is student learning, the essential goal of any plan, around the outside is leadership, which is essential to the plan’s success.

Figure 2: The Conceptual Framework for the Digital Learning Transition MOOC-Ed
The Deeper Learning for Disciplinary Literacy uses a Model for Inquiry-Based Disciplinary Learning developed by the MOOC-Ed team (Spires, Kerhoff, Graham and Lee, 2014), and shown in Figure 3.

![Figure 3: The Conceptual Framework for the Disciplinary Literacy MOOC-Ed](image)

The Coaching Digital Learning included instructional frameworks and an approach to coaching to provide structure in the coach’s daily work:

“I have been a technology integration coach for the past two years, but only now [after the MOOC-Ed] have a strong grasp of what that is supposed to mean. I can evolve with this new information. I had heard of most of these topics before, but they hadn't been put into a clear coaching framework for me. I am grateful.” -- Coaching Digital Learning MOOC-Ed Participant
The use of conceptual frameworks with each MOOC-Ed supports the following design principles:

- **Self-directed learning**, by providing an overall picture of the MOOC-Ed content to help participants make decisions about their own path.
- **Job-connected learning**, by linking resources and activities to their professional practices.
- **Multiple voices**, by providing a structure that shows the value of different perspectives and expertise within the overall goals of the MOOC-Ed.

### Student Scenarios

This design element combines a video, related resources, and a discussion. It begins with a video of one or more students working through a challenge, such as a mathematics problem. The videos are selected so that, within 2 to 4 minutes, they show some things the student knows and can do, while leading to a point at which the student is puzzled, makes an error, or demonstrates a misconception. The video ends at that **instructional decision** point and participants discuss what they would do next. This leads to rich discussions sharing pedagogical content knowledge in interpreting what they have seen and instructional strategies in recommending next steps.

In Fractions Foundations unit 2, for example, a three minute video shows a third grade student named Myles working on this problem:

*At a party you cut one cake to share fairly among three people. How much cake did each person get?*

Myles begins dividing the cake into halves and then divides one half into two pieces to get three pieces, as shown in Figure 4. This divide-in-half repeatedly strategy is
common among students his age and enables them to succeed with fractions that have denominators of 2, 4 or 8, but not with other denominators. On examining his work, Myles realizes that this division of the cake “would not be fair.”

Figure 4: Myles’ first attempt to divide the cake into three equal shares.

He then divides the second half into two, so that he has four equal size pieces. But that raises the question of what to do with the extra piece, since the cake is to be shared by three people. Myles says that “we cut it [the extra piece] up so that there will be more for each person.” He attempts to do so as shown in Figure 5, with the letters marking the person to receive each piece. But he still lacks a strategy for dividing a shape into equal thirds or sixths.

Figure 5: Myles’ second attempt to divide the cake into three equal shares.
At that point, the video ends and the *What would you do next?* discussion begins. In their postings participants recognize that Myles has a good sense of fair sharing and could do the problem if there had been four people, but is struggling with how to equally split something into thirds. They suggests various strategies, including using physical manipulatives (such as pattern blocks or fraction strips) that can show thirds and other fractions, tangible items such as a candy bar, other shapes (such as circles or rectangles) that may be easier to divide into thirds, paper folding activities, sharing money activities, pre-made drawings and other approaches to scaffold Myles’ understanding.

A different approach to student scenarios is utilized in the Learning Differences MOOC-Ed by having students who are now in college and beyond share their experiences growing up with learning differences. They share strategies that worked and explain their own views of how teachers supported them. These videos provide an important context for teachers to consider strategies that can help their own students and also to consider students who may have learning differences similar to the students in the videos. The discussions about these interviews involve possible strategies and other realizations about how a teacher may support struggling students. One participant shared:

“Molly had a great story. I was so glad to see that she had made it - she did what she wanted to do with the support of others. Teachers were a big factor in her success but they could have been the opposite. It is the caring teachers who offer additional help and who go beyond their ordinary duties that make school a success for students like Molly. Personally, recognizing that working memory deficits are quite common is something I need to work on. I often perceive children that are not focusing, behaving, or completing work as being
intentionally off task. I need to work harder on being more attuned to this type of need.” – Learning Differences MOOC-Ed Participant

This example encompasses the following design principles:

• **Job-connected learning** in that this is exactly the type of analysis of students’ thinking and instructional decision-making that teachers need to do in their classrooms every day.

• **Peer-supported learning** and **multiple voices** in that the major ideas about scaffolding students’ understandings with different types of materials and activities come from the participants themselves, with many different people contributing to the discussion.

**Expert Panels**

This design element brings the voices of experts – researchers, school and district leaders, teachers, policymakers, and others with specific relevant expertise and experience. In an informal interview setting conducted via Google Hangouts, one of the course facilitators interviews the expert panelists, asking them to share challenges, lessons learned, strategies, and other things they “wish they knew earlier” and believe would be of value to other educators. We provide a carefully edited version in video, audio and transcript formats, and include an index of the questions asked with the time marker for each.

For example, the *Digital Learning Transition* has expert panels in each unit comprised of school, district state, and national leaders who have significant experience in leading digital learning transitions. Over the eight units of the course, more than 30 experts participated in panels. They were encouraged to also participate in the discussions, and some actively did so as guest experts.
This design element reflects the following design principles:

- **Multiple voices** in that we do not select a single “guru” for the course or even for a unit, but intentionally have different perspectives represented with interactions among them.

- **Job-connected learning** in that the panelists are selected to have significant practical experience in the areas relevant to their topic and are asked to share their personal experience, as well as the research and theory that informed their practice.

- **Self-directed learning** in that we provide a detailed index to the questions and respondents for each panel, enabling participants to focus their time on those topics and speakers in which they are most interested.

**Participant Projects and Peer Feedback**

MOOC-Eds generally incorporate one or more project options for participants that are woven through multiple units. The goal of the projects is to have participants connect what they are learning in the MOOC-Ed with their own professional responsibilities and context. We also incorporate a peer-feedback process in which participants are asked to provide constructive feedback to others’ projects. This is done in the discussion forum to allow for interactions about the projects.

Two examples illustrate different ways in which projects are integrated into MOOC-Eds to fit the content and audience of the individual course.

In *Coaching Digital Learning: Cultivating a Culture of Change MOOC-Ed*, participants are asked to develop an instructional technology coaching action plan for guiding teachers toward effective digital learning. This plan is introduced in the first unit, where templates are provided for both individual and team plans. The template guides
additions to be made during each unit of the course, gradually leading to a complete plan that addresses communication and collaboration strategies; helping educators expand their online learning networks; using the TPACK (Mishra, Koehler & Henriksen, 2010) and SAMR (Puerntedura, 2012) frameworks to guide coaching teachers; promoting digital age skills (communication, collaboration, critical thinking, creativity) in your school; addressing digital citizenship to develop a safe and responsible digital learning culture; and helping teachers select tools and resources for use in their classrooms. At each step, participants have the option of sharing their developing plans for feedback from their peers. One participant shared the following feedback after developing the action plan:

“Coaching Digital Learning helped me have better conversations with teachers and clarify my own thought process in preparing for those conversations.... Now I feel very confident in speaking, teaching and coaching teachers how to effectively reach their idea of an optimal learning environment.” Coaching Digital Learning MOOC-Ed Participant

The Fractions Foundations MOOC-Ed provides two project options. The first, intended for classroom teachers, asks them to select, in one or more units, a fractions problem to try with their class or a small group of students. They are then asked to conduct interviews with several students to understand students thinking, based on those modeled in the What would you do next? activities. Finally, they are asked to share their reflections in the discussion forum and provide feedback to their colleagues. Participants who are not current teachers are invited to propose their own project topics that fit their
professional roles, such as planning a professional development activity or facilitating a professional learning team.

The project and feedback design element reflects the following instructional elements:

- *Self-directed learning*, in that flexibility is provided in each MOOC-Ed to allow participants to design their own project to meet their own professional needs.

- *Job-connected*, in that the projects are specifically related to the work and context of each participant.

- *Multiple voices*, through feedback received from multiple peers, not just from one instructor.

- *Peer-support learning*, both in the provision of peer feedback and in the encouragement, when possible, for participants to collaborate with local colleagues on their projects.

**Resource Collections**

Each MOOC-Ed contains carefully selected and annotated sets of core resources in each unit. Many units also provide additional “digging deeper” resources for those who want more information about selected topics. Resource collections typically include the following.

- Short videos, including presentations by educators, researchers, policymakers and organizational leaders; video case studies of classrooms, schools and districts; summaries of relevant conceptual frameworks and research; first-person accounts by students, teachers and administrators; and provocative scenarios (e.g., about schools of the future).
• Documents, which in some cases provide an alternative source of similar content to that found in the videos; in others they complement a video and provide more in-depth information; and in still others the documents provide information that is not available in video form.

• Websites that provide rich resources relevant to the topic of the unit. These may focus on research, practice or policy, depending upon the MOOC-Ed. They may be designed for specific members of the audience (e.g., online communities for literacy teachers or math teachers). Or they may address specific topics (e.g., competency-based education, responsible use of technology, learning management systems) of interest to a subset of participants.

• Apps that participants may find useful. Depending upon the MOOC-Ed audience, these may provide: student learning activities and tools that teachers may integrate into the curriculum; tools to help organize a collaborative planning process; communication tools; information collection tools; and many other functions.

• Recommended activities for local professional learning teams related to the MOOC-Ed. This may include a replicable activity, like completing a Learner Sketch, that an educator could then use with his/her staff or students.

Far more resources are provided that any one participant would be expected to use. The goal is to provide resources that meet the variety of goals and interests of the participants, while provided information that enables participants to select those that are most valuable to them. For example, the Digital Transition MOOC-Ed contains case study resources from small and large public schools, charter schools and independent schools at the elementary, middle and high school levels, so participants can select those that are most
relevant to their own schools. The Learning Differences MOOC-Ed contains personalized pathways with resources for teachers of different age students and different types of learning differences, while the Disciplinary Literacy MOOC-Ed contains pathways for teachers of different disciplinary areas.

The MOOC-Ed resources reflect the following design principles:

• *Multiple voices*, since they contain a range of presenters and authors representing different perspectives and areas of expertise.

• *Self-directed learning*, since resources are grouped and annotated to support participants in meeting their own goals.

• *Job-connected*, because they are selected to be relevant and useful in participants’ contexts.

*Asynchronous Discussions and Twitter Chats*

Given the number of participants and the time flexibility required to allow 24/7 engagement across worldwide time zones, asynchronous discussions are the primary form of exchange in all the MOOC-Eds. The MOOC-Ed facilitators pose discussion starter topics; participants can contribute to those topics, start new ones, comment on prior postings, and rate messages (as described below under *crowd sourcing*). To keep discussions to a manageable number of participants, we typically divide them according to the first letter of their city, state or country, which keeps a mix of roles and other factors in each discussion. However, in some cases we have divided discussions by areas of interest or roles. We continue to explore the optimal ways to form discussions groups.

In some MOOC-Eds, we also conduct scheduled synchronous twitter chats and then provide an archive of the tweets. For example, the *Coaching Digital Learning*
MOOC-Ed provides three opportunities for Twitter chats based upon the current unit. Participation has been very high, and the hashtag used in conjunction with the course has continued to be used with the community long beyond the MOOC-Ed. This provides an opportunity for those who prefer this form of short, informal synchronous messages to share their questions and ideas.

The discussion forum and twitter chats reflect the following principles:

- **Peer-supported learning**, by encouraging interaction and knowledge creation.
- **Job-connected**, through these peer exchanges about their own experiences, challenges, and questions.
- **Self-directed**, as participants choose which discussions and chats they use, either as contributors or just as viewers.

**Crowd-Sourcing**

One of the questions for designers of MOOC-Eds is how to take advantage of opportunities afforded by a large number of participants. While MOOC-Eds do not have the registration size of some other MOOCs, the numbers are sufficient to collect valuable information with crowd-sourcing techniques to both inform current participants and improve future versions of the MOOC-Ed.

In the most recent round of MOOC-Eds, we have implemented a “star” rating system for each resource, similar to that used by Netflix, Amazon and others. We provide a summary of these ratings to participants to help them select resources – videos, documents, websites and apps – to explore further and to share with their local colleagues. We also use these ratings when revising the MOOC-Eds for the next group of participants. In addition, we plan to analyze patterns of ratings to inform a simple recommendation
system for future MOOC-Eds. For example, if teachers tend to prefer one resource, instructional coaches a second, and administrators a third, we will use that information to provide role-specific information to help participants choose resources they are most likely to find valuable. We also use crowd-sourcing to solicit recommendations for additional resources from participants and to provide annotated lists of participant recommended resources.

Another use of crowd sourcing is in the discussion forum. In the current version, participants can choose one of four tags for a discussion posting: critical issue, great tip, agree and not convinced. This provides a very quick way for participants to respond to postings without entering their own statements. It also enables other participants to quickly identify postings of interest, and allows the course facilitators to elevate highly rated postings to the top of a discussion.

This design element supports all four of the design principles, providing information from peers to help participants self-direct their experience, with the recommendations adding job-connected resources that provide additional perspectives and voices.

**MOOC-Eds within Blended Learning Programs**

Based on our experience and research so far, we consider MOOC-Eds to be valuable new additions to the set of professional learning opportunities for educators. However, feedback from participants tells us that MOOC-Eds are most valuable when participants work through them together with local colleagues and discuss how the MOOC-Ed resources and activities apply to their local context. Many instructional elements of the MOOC-Eds provide tools and connections for blended learning programs.
For example, the resource collections can be used in local activities; the projects directly connect with local contexts and professional roles; and classroom activities such as *What would you do next?* (described above) provide opportunities for peer discussions and coaching.

We have been conducting a variety of explorations of different ways of connecting MOOC-Ed to other professional learning activities. These include:

- We have “wrapped” for-credit graduate courses at NC State University around the Digital Learning Transition and Coaching Digital Learning MOOC-Eds. In these courses, students engage in initial small group discussions with the instructors and they each select a project topic. They then participate in the MOOC-Ed while also working on their projects. After the MOOC-Ed, the students complete and present their projects to complete the requirements for course credit.

- We have connected the Digital Learning Transition MOOC-Ed with a year-long blended program designed to prepare North Carolina principals to lead digital learning initiatives in their schools. This program involves six, 1.5 day face-to-face sessions with intervening online activities. The MOOC-Ed provided the online activities for the first two sessions. We are currently planning to pilot a revised version of this program in other states.

- The Disciplinary Literacy MOOC-Ed is working with a group of teachers in a local school who are using it to structure their face-to-face interactions in their professional learning team. The MOOC-Ed designers have drafted a guide for facilitating local face-to-face sessions that extend the MOOC-Ed experience.
• The Learning Differences MOOC-Ed is working with Teach for America, New Teacher Center, Teach for All, and Big Brothers-Big Sisters, which each organization planning to blend the MOOC-Ed with other professional learning activities for its members with a particular focus on coaches who are working with the teachers who participated in the MOOC-Ed.

**Research Directions**

Our MOOC-Ed initiative involves a significant research agenda, using the abundance of data available. Completed research has already been reported in Kleiman, Wolf & Frye (2014); and Kellogg, Booth & Oliver (2014).

Below, we summarize three of the major research areas our team is addressing, along with specific questions and notes about the major types of data being analyzed for each. These questions will provide information about how participants with different roles, goals, experience and expertise participate in and benefit from the MOOC-Ed. This information will inform future design and development for our MOOC-Eds, as well as provide general findings about the design principles, instructional elements, impact on participants, and user experiences that will be informative for the field of online professional development.

**Questions about peer-supported learning:**

1. In what ways, and to what extent, do educators engage in peer-interactions in the discussion forum?

2. How do educator characteristics, such as roles, goals for taking the course, levels of experience, and comfort with online learning, influence their interactions?
3. What is the content and quality of peer-interactions and to what extent do they support learning?

These questions are being addressed by social network analyses of the discussion forum postings to describe and categorize the patterns of interactions and the roles different participants play in the discussions; along with network modeling and discourse analyses to assess the content, depth, and educational value of the discussions. These analyses also make use of participant data obtained through a registration survey and examined in light of participants’ engagement in other aspects of the MOOC-Ed, through the detailed analytic data that we can use to track each individual’s participation. The results may help us refined our approaches to framing discussions and grouping participants for discussions.

**Questions about self-directed learning:**

1. Do participants stated goals for participating in the MOOC-Ed or their occupational roles lead individuals to take different paths through the course?
2. Are there patterns in the use and ratings of resources that differ across participants with different goals and/or roles?
3. Did the perceived usefulness of various course instructional elements differ by stated goals or occupational roles in a MOOC?

Exploring these questions uses the combination of the participants’ characteristics as determined in the registration survey, participants’ ratings of the value of the different elements in the course, and the extensive analytics data. The data allows us to trace which resources participants selected, how long they watched selected videos, how they rated the resources they selected, and how they engaged in discussions, projects and other
activities. We anticipate that the results will help us develop more effective ways to
guide participants to self-direct their experiences in the MOOC-Ed to meet their own
goals and interests, including the use of simple recommendation engines.

Questions about impact of the MOOC-Ed on participants’ knowledge and practices.

1. Does participation in a MOOC-Ed lead to changes in participants’ professional
   knowledge?
2. Does participation in a MOOC-Ed lead to changes in participants’ professional
   practices?
3. Does participation in a MOOC-Ed lead to increase performance by students, teachers
   or schools (depending upon the focus of the MOOC-Ed.

We use surveys in each MOOC-Ed to ask participants to self-rate how much they
have learned and the likelihood it will impact their professional practices. In several
MOOC-Eds, we also now includes a pre- and post-assessment of some of the major
content. For example, the Fractions Foundation MOOC-Ed uses pre- and post-
assessments of participants pedagogical content knowledge. One dissertation study, also
based on the Fractions Foundation MOOC-Ed, adds classroom observation before and
after the course, to assess impact on teaching practices. In the Learning Differences
MOOC-Ed, we are also planning to follow-up with some participants, especially the
coaches, to see changes in the work of educators months after the course ends. We also
find evidence of impact of participation in the discussions and submitted projects.

Conclusions

Our MOOC-Ed initiative, now just two years old, has convinced us that MOOC-
Eds can provide personalized, accessible, effective, scalable PD for motivated
professionals. We have also found that our design principles provide a solid foundation for MOOC-Eds. Our research is beginning to provide information to inform further improvements in how MOOC-Eds can meet the needs of large number of educators through self-directed, peer-supported, job-connected learning. It also confirms that the critical question is not *Do MOOC-Eds work?* but rather:

- How can we optimize the value of MOOC-Eds?
- What professional development needs do they best serve?
- How can MOOC-Ed be blended effectively with other PD approaches?

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