Research-Based, Online Learning for Teachers

What the research literature tells us about the design of platforms and virtual experiences for working adult learners

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Quality Online Teacher Learning Experiences: A Research-Based Review

Educators and the people who support their development are increasingly looking for online, professional learning that is differentiated to their unique needs and offers the ability to learn anywhere, anytime. Tools and platforms have proliferated in response to this demand, and teachers, leaders, and professional development providers have many options to choose from.

What does the research say about if and how online, asynchronous and synchronous, learning experiences are effective means for teacher learning? And how might teachers and the people who support them select tools and experiences that are likely to help them meet their professional learning goals?

The Learning Accelerator (TLA), a national nonprofit, conducted a deep review of the academic and professional literature to help answer these questions. The results of this work, contained in this guide, lay out a research-based framework for thinking about the design of effective online professional learning.

Contents of This Research Paper

In the pages that follow, you'll find an overview of the findings, first in summary and then more deeply in six key "quality drivers" our team identified. Finally, we've included a reflection tool to support educators and system teams in their work.

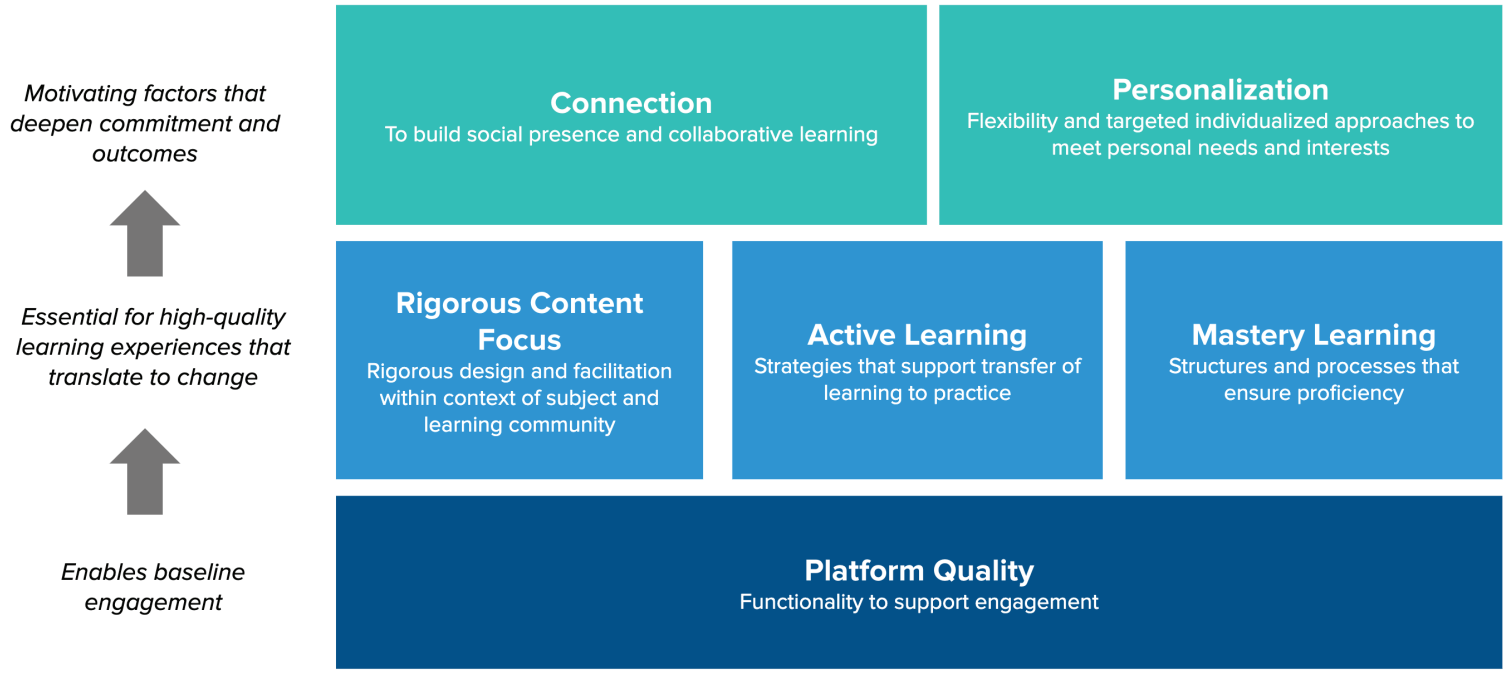
Framework: Six Quality Drivers for Online Teacher Learning

The purpose of professional learning is to build critical knowledge and skills that transfer to day-to-day practice. There are numerous existing, research-based theoretical frameworks for effective professional learning in more traditional offline settings[1]. While terms used and specific organization vary by framework, there are common elements that appear throughout and that can be used as the basis for assessment of adult learning products and approaches.

At the same time, online and asynchronous (that is, learning that occurs independent of others) approaches build upon the features of effective traditional professional learning while leveraging the benefits technology can provide to more deeply engage and meet the needs of learners[2]. Effective design of online experiences should mitigate the known downsides associated with online approaches (such as lower reported learner engagement and satisfaction, the need for relationship building, and challenges to persistence).

In TLA's examination of the literature (which is explored and cited more deeply in the sections to follow), we identified six core quality drivers that support effective online teacher learning, which are illustrated below.

Quality Drivers for the Design of Online Learning Tools for Teachers



At the base of this framework lives the quality of the tool or platform that supports learning online. Next are three drivers that are essential for adult learning experiences that lead to transfer of new knowledge and skills into action, including rigorous, relevant content focus, active learning, and mastery learning. Finally, and critical in online environments, are two drivers that help motivate learners and keep them engaged and committed: connection and personalization.

1 For example, see: Darling-Hammond et al., 2017; Deans for Impact, 2016; Ingvarson, 2005; Archibald et al., 2011

2 Bonk & Cummings, 1998

This framework is meant to serve as a way to organize the existing research on effective adult learning online and offline. It's not exhaustive, but our hope is that it offers an understandable way to organize and assess design features. Finally, it's important to note that while this framework shows them as separate, many of the drivers are interrelated and, in fact, amplify each other. (For example, personal, individualized feedback can help establish feelings of "social presence," and therefore connectedness, in online courses[3].)

Specific features of each driver are outlined in the table below and the guide sections that follow.

Platform Quality	Perceived ease of use Effective delivery that reduces cognitive load Ongoing and accessible support Flexibility to connect learners to blended/synchronous modalities
Rigorous Content Focus	Contextually appropriate and relevant based on subject area as well as school/system goals Content modeling Meaningful expert scaffolding and moderation
Active Learning	Mechanisms for active engagement with content (including collaboration) Mechanisms for metacognition Embedded application Opportunities to teach others on as well as demonstrate key concepts in action
Mastery Learning	Sustained learning opportunities Deliberate practice with feedback Assessment and feedback
Connection	Connection to expert/teacher Collaboration with peers Features that support social presence
Personalization	Activation of existing expertise and knowledge Personal goal setting and individualized support Perceived relevance

3 Dunlap & Lowenthal, 2014

How Does Diversity, Equity, and Inclusion Fit Into the Design and Assessment of Online Learning Experiences?

"Design of web-based instruction is not culturally neutral, but instead is based on the particular epistemologies, learning theories and goal orientations of the designers themselves."
(McGloughlin and Oliver[4])

Learners from different backgrounds and demographics experience instruction differently based on their comfort with and cultural proximity to the assumptions and expectations of tool creators. For example, students exhibit cultural differences in participation approaches in online discussions[5] suggesting a need for active modeling and expectation setting. How students are motivated to engage with and persevere during learning experiences has been found to differ across students based on culture, gender, and age[6].

Tool creators and course designers must therefore actively interrogate how their design of resources and experiences will be interpreted by students coming from multiple cultural backgrounds and contexts — incorporating factors such as assumed familiarity with modality and background materials, desired relationships with peers and instructors, motivational and assessment approaches. Designers must incorporate multiple approaches in cross-cultural and identity settings.

How might they do this? Designers must think holistically. Design factors that influence how well (or not) different learners experience an online tool are integrated across all aspects of platform and content design. Creators can and should proactively address issues through a variety of strategies, such as:

- supporting differences in communication styles through multiple modalities;
- offering many channels for communication;
- encouraging students to actively bridge instructional concepts to their own cultural and community context as well as bring in their own resource additions;
- peer scaffolding (instruction, supports, collaboration, etc.) and explicitly encouraging cross-cultural understanding and inquiry;
- offering choice through multiple modes of delivery and assessment; and,
- providing maximum clarity and transparency on tasks and expectations[7].

As we explore key quality drivers through the remainder of this guide, we've included specific questions that can support reflection on diversity, equity, and inclusion issues.

4 McGloughlin & Oliver, 2000, p58
5 Yang, Olesova, & Richardson, 2010
6 Lim and Kim, 2003; Lim, 2004
7 McGloughlin & Oliver, 2000; Yang, Olesova, & Richardson, 2010; Parrish & Linder-VanBerschot, 2010; Yang et al., 2014

Understanding the Context for Implementation

At the start of this study, the TLA team sought first to answer two questions about the context for using online tools for currently practicing teachers. We asked "Is asynchronous online learning an effective strategy for adult learners? If so, what do we know about what in-service teacher learners need and how well can online tools support them?"

1. Can "online" approaches to professional learning work?

First, what does the research tell us about the "warrant" for pursuing online learning (asynchronous and/or synchronous) for teachers? How does this learning approach differ (or not) from other professional learning implementation contexts?

The research suggests that "good" teacher learning — and indeed, learning at any age or stage[8] — is simply good learning across modality, assuming that the design for online approaches acknowledges and capitalizes on differences experienced by learners in online environments[9].

Multiple studies of adult learning find no significant, consistent difference in outcomes between online versus face-to-face learning environments. The most comprehensive review of studies of online and blended learning efficacy to date found adult learners in fully online or partially online environments tend to perform better than those in face-to-face ones[10].

The introduction of specific modalities or technologies (e.g., videos), in and of themselves, do not appear to add or detract from student learning or be generally associated with specific outcomes[11]. Efficacy is the result of not one or two specific technology design factors, but rather the "combined influence of implementation, context, and learner characteristics as these factors interact with technology[12]." Students sometimes express greater satisfaction with in-person approaches, but these differences do not translate to higher learning gains[13]. In fact, in some cases online learners have shown higher long-term retention as well as better outcomes for certain types of knowledge building[14].

Online-only and asynchronous formats can offer specific advantages but also pose unique, but not insurmountable, design challenges to address. The potential design and experiential advantages online approaches can provide include accessibility for learners (access, flexibility), personalization, and standardization (typically difficult when seeking to scale face-to-face experiences across multiple instructors)[15]. Online environments can offer ways to reduce risk and bias in participation by downplaying individual differences in physical appearance (e.g., gender, age, race, or disability) that may affect others' responses to them as well as offer individuals opportunities to try new approaches to participation outside of local context[16]. They can also offer greater inclusion for learners with special needs (either cognitive — wherein they can offer supports not present in a traditional, in-person format — or accessibility)[17].

8 Bransford et al., 2004
9 Community for Advancing Discovery Research in Education, 2017
10 Means et al., 2009
11 Means et al., 2009; videos, DeLozier & Rhodes, 2016
12 Ryan et al., 2016, p. 296
13 Olivet, 2017
14 Olivet, 2017; Sitzmann et al, 2006
15 Mrazek et al., 2018
16 Community for Advancing Discovery Research in Education, 2017
17 Elias, 2010

At the same time, to realize potential advantages, learning designers must understand and address meaningful differences between in-person and online settings. Simply replicating traditional offline approaches (e.g., synchronous, one-way instruction from teacher, such as lecture) tends to result in worse performance in online environments, particularly if only some students are learning online[18]. Initiating and sustaining engagement can take on new levels of challenge. In addition to differences in learner satisfaction, likely related to sense of connection to others [19], there are differences in engagement, relationships, and collaboration, which can be weaker than in blended or offline communities[20]. Finally, because online learning requires more independent work, students will likely need more support to trigger active engagement, reflection, self-monitoring, and self-regulation. (For example, one study found successful online-only students use more self-regulation strategies than those in blended learning approaches, even though they achieve similar levels of performance.)[21]

Blended implementation formats have shown advantages over purely online or face-to-face approaches[22], likely because when designed well they maximize benefits while minimizing downsides of any one modality[23], allowing the optimal use of resources[24]. For example, by offering opportunities for authentic, in-person interaction, blended approaches can help solve for the lower levels of learner satisfaction experienced in online-only environments (e.g., one study found video assignments along with in-class work problems significantly improved engagement and satisfaction as well as overall course outcomes[25]). Offering blended opportunities in addition to online online learning can enhance feelings of community and inclusion[26]. (Conversely, requiring synchronous learning sessions without proper support can be less inclusive for cognitively atypical learners[27].) Examples of blended approaches include:

- Bringing together all the teachers in a particular school or community around context-specific examples or goals (i.e., "where the work of teaching and learning resides")[28].
- Embedding online tools and activities within face-to-face sessions so that participants have the opportunity to increase their comfort and skill before working independently online[29].
- Offering synchronous, online meetings every six to eight weeks to encourage ongoing participation in offline components[30].

Given this, it seems blended approaches to tool implementation should be considered when possible.

2. What do we know about in-service teachers' learning needs? What are the design implications for this group?

Effective professional learning approaches take into account the unique needs of the learners they seek to serve. Failure to address the complexity of their professional and personal lives, their unique motivations, and the context in which their practice change must take place likely predicts failure of any given professional learning strategy.

The research suggests that in-service teachers fall into a "nontraditional" category given they must fit learning into and around other professional and personal needs. These learners, given their preferences, strengths, and needs, are likely uniquely well-served by high-quality asynchronous learning approaches. They navigate many competing demands but also bring social supports[32] and experiences that "make meaning of theoretical constructs that may be

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18 Bernard et al., 2004, Means et al., 2009
19 Olivet, 2017
20 Macia & Garcia, 2016; Community for Advancing Discovery Research in Education, 2017; Hart, 2012
21 Means et al., 2009; Broadbent, 2017
22 Means et al., 2009; Liu et al, 2016
23 Glazer, 2012; Reich, 2015; Stockwell et al., 2015
24 Kauer, 2013; Holden & Westfall, 2006
25 Stockwell et al., 2015
26 Rodrigo & Nyugen, 2013
27 Elias, 2010
28 Little, 2006
29 Community for Advancing Discovery Research in Education, 2017
30 Community for Advancing Discovery Research in Education, 2017
31 Kamenetz, 2018; Guskey, 1986 and 2002

purely abstract to younger learners." Further, as adult learners (sometimes referred to as "androgogues"), they are likely to exhibit learning readiness based on the "need" to know, are internally motivated, prefer self-direction, and orient towards problem-centered rather than subject-centered learning[33].

In-service teachers are therefore likely particularly well suited to an online, asynchronous approach that supports their self-direction and motivation to improve as professionals, provided the approaches are well-designed and aligned to their beliefs and goals. Professional learning experiences for these teachers should therefore:

- leverage past experiences as resources for new learning[34];
- allow for choice in learning opportunities based on interest and motivation as well as specific classroom experiences and needs[35];
- center reflection and inquiry in the learning and development process[36];
- be flexible with the timing and nature of tasks informed by the competing demands on time, where task loads are clear, and realities of teacher personal and professional schedules[37]; and,
- clear and realistic student understanding of workload[38].

Finally, in-service teachers, as opposed to novices, bring existing "teaching body of knowledge"[39] and experience that shape current practices and beliefs, so professional learning efforts must seek to leverage and, as appropriate, adjust or reframe. This means that:

- Effective professional learning must activate prior knowledge[40].
- Changes in existing teacher practice are strongly tied to knowledge as well as beliefs about how new approaches will lead to improved outcomes in their classrooms. Effective professional development must address the need for change connected to a clear theory for how successful implementation will meet that need[41], which requires provision of both new mental models as well as actionable strategies.
- In some cases, to do this well, professional development experiences must surface misconceptions and connections to challenge and alter core frames of reference that already exist ("transformation"[42]). One such mechanism for doing so is critical reflection[43].

Key Takeaways Regarding Implementation of Online Professional Learning:

Adult learning through an online platform can likely be as effective as any other high-quality learning experience, assuming designers and instructors are operationalizing learning science-informed quality principles in their design and ongoing facilitation (either human or technologically mediated). However, incorporating some face-to-face elements in "blended" formats can lower the difficulty of the task and should be considered. While "good learning is good learning," platform and professional development designers must think specifically about and tailor to the needs of in-service teachers, as they differ significantly from traditional student populations.

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32 Holder, 2007; Müller 2008; Park & Choi, 2009
33 Knowles, 1980; Ross-Gordon, 2011
34 Trotter, 2006
35 Trotter, 2006
36 Trotter, 2006
37 Community for Advancing Discovery Research in Education, 2017; Ivankova & Stick, 2007; Nash, 2005; Müller, 2008; Bunn, 2004
38 Bunn, 2004
39 Schulman, 1986 and 1987
40 Trivette et al., 2009
41 Guskey, 2002
42 Mezirow, 2000
43 Cranton, 1994

The Baseline: Platform Quality

The quality of experience on any tool or platform has been found to be key to engagement, motivation, and persistence. This is particularly true for teachers who are less experienced with technology and online learning. Specifically, the research indicates that:

- **Perceived ease of use (and of support-finding) matters**. Perceptions of quality, reliability and ease of platform operation, interface, and tools have significant influence on reported learner satisfaction and intrinsic motivation[44]. This is true for the general user experience design as well as perceptions of ongoing and accessible technology support, which is positively associated with willingness to try as well as persevere[45]. From an equity and inclusivity standpoint, designers incorporate universal instructional design principles to ensure equity of access and inclusion[46] as well as meet web accessibility standards and easy integration of other assistive tools. Finally, ratings of "network quality" on platforms is positively associated with ratings of learner satisfaction and perceptions regarding the time cost of the learning (which influences engagement)[47].
- **Designers can make choices to reduce the cognitive load imposed by the tool**. If learners have to spend too much energy navigating the platform and course design, it can reduce the energy available to focus on the actual learning tasks. Avoiding this load leveraging ubiquitous and familiar platforms and functionality can reduce participants' "cognitive overhead" (thus helping them deploy focus towards learning tasks)[48]. This objective can be supported by consistency of module design; fewer modules per course/unit is positively associated with student satisfaction, engagement, and perceptions of learning[49].
- **Tools that can accommodate, if not encourage, blended modalities to support initial onboarding and learning can be an effective strategy** for allowing participants the opportunity to increase their comfort and skill before working independently online[50].

Platform Quality in Action:

What should we look for in potential platforms? Consider the following elements:

- Quality of design/user experience (attractiveness, ease of sign up/onboarding/navigation/interaction)
- Clarity and consistency of content design (predictable design, allowing the user to focus on learning the content, not making sense of the organization of the content or tool features)
- Presence of easy-to-find support resources (both guides but also troubleshooting in the form of personalized support/chat/bots)
- Ability to connect asynchronous (online-line, independent) experiences with blended and synchronous (group-level) learning formats
- Accessibility for learners with special needs (e.g., devices, cognitive assistance)
- Visual inclusiveness (diverse imagery and representation)

Read more about how these features are currently operationalized in different platforms and learner experiences.

44 Kintu et al., 2017; Ho & Dzeng, 2010
45 Bunn, 2004; Ivankova & Stick, 2007; Ojokheta, 2011
46 Elias, 2010
47 Ho and Dzeng, 2010
48 Mayer, Heiser, & Lonn, 2001; Community for Advancing Discovery Research in Education, 2017
49 Swan, 2001
50 Community for Advancing Discovery Research in Education, 2017

Factors that Drive Quality Learning with Transfer to Practice: Rigorous Content Focus, Active Learning, and Mastery Learning

Effective teacher online learning must, above all, focus on providing new skills and knowledge in rigorous ways that support transfer of this learning to the classroom. Designers must engage teachers with expert support in their content areas as well as encourage active, mastery-based learning.

Rigorous Content Focus

Professional learning must be directly applicable to the day-to-day practice of a teacher to change student outcomes. Effective learning then (offline or on) focuses on the content of teaching, integrating the "what" to teach with the "how" to teach it, with the highest outcomes being for subject-specific trainings (i.e., math content for math teachers)[51]. The research suggests:

- **The more context-specific focus (embedded, situated in classrooms with students) the more likely teachers are to enact practices** that serve the diverse needs of students across settings[52]. Learning should also align to teachers' understanding of community priorities and goals (e.g., other PD, stated goals, existing shared vocabulary)[53] which not only builds perceptions of relevance as well as an understanding of community norms, which influences intention and motivation to learn and adopt[54].
- **Teachers should be exposed to clear models for concepts, strategies, and ideas in action**[55]. Presentation or conceptual explanation of any given learning topic is necessary but insufficient. Observing successful practices of others supports beliefs about the need for change and deepens understanding of practice[56]. Encouraging teachers to engage in action-research activities (application, reflection, feedback on application, etc.) using these models can deepen understanding[57]. Group analysis and discussion of these models builds conceptual understanding of applied principles[58].
- **Strong expert presence is needed to design, scaffold, and facilitate learner engagement with content**, whether accomplished through effective up-front design, mediated (or even automated) by technology, or through more traditional instructor facilitation. While effective adult learning experiences should be learner-centered, not all learning should be independent or self-directed; instructor-led learning has been found to be an important and effective online learning component[59]. Instructors must act proactively and creatively to trigger and facilitate effective learner behaviors[60]. Some behaviors, such as interleaving (i.e., studying related concepts and ideas in parallel)[61], can be designed up front by an expert content designer. However, expertise is also needed along the way to address inconsistent, unchallenged, or misunderstood ideas as well as to offer guidance for learners to course-correct[62].

51 Cohen & Hill, 2000; Ingvarson, 2005; Archibald et al., 2011; Darling-Hammond et al., 2017
52 Darling-Hammond et al., 2017
53 Archibald et al., 2011
54 Ajzen, 1991
55 Bransford et al, 2004; Ingvarson, 2005; Archibald et al., 2011; Darling-Hammond et al., 2017
56 Zhao and Cziko, 2001
57 Bransford et al, 2004; Ingvarson, 2005; Archibald et al., 2011; Darling-Hammond et al., 2017
58 DeLozier & Rhodes, 2016
59 Means et al., 2009
60 Means et al., 2009, Community for Advancing Discovery Research in Education, 2017
61 Deans for Impact, 2016
62 Kanuka & Anderson, 1998

Rigorous Content Focus in Action:

What should we look for in potential platforms? Assuming a tool offers content, an assessment of how well that content will help a teacher apply learning directly to their context and in their content area is necessary. Platforms should offer ways to:

- Target content to the context of the learner (be it their subject area, content level, etc.), rather than expecting teachers to extrapolate general advice or models
- Bring learners within a given community (school, subject-area, problem of practice) together around shared models as well as opportunities for application and reflection of those models in authentic environments
- Provide direct, ongoing expert support to learners through effective upfront course design, facilitation, and triggering of behaviors that help learners engage appropriately with content
- Encourage reflection to surface and re-frame existing models of practice

Read more about how these features are currently operationalized in different platforms and learner experiences.

Active Learning

Learning experiences must foster direct engagement with the materials and tasks. Active learning is consistently cited across frameworks as a critical component for teacher learning — online and offline[63]. Studies clearly indicate that more active strategies for engagement foster increased perseverance[64] and performance[65].

Active learning strategies appear to be even more critical for online environments where learners are working individually and in a self-regulated manner[66]. Further, the more active strategies employed, the higher the likely learning and transfer to practice: "as training moves along the continuum from more passive information-based methods (e.g., lectures) to the most engaging methods (e.g., behavioral modeling and hands-on demonstrations), [...] greater knowledge acquisition and more transfer of training to the work setting will occur."[67] This is likely because active forms of engagement facilitate both transformation of existing knowledge[68] as well as transfer or new ideas through retrieval and the active production of new information[69].

Strategies cited in the research vary widely, but can include the purposeful integration of:

- **more interactive instructional materials** (interactive video, response clickers, understanding checks, etc.),
- **application tasks** (evaluation of student work, trying out strategies in classroom, etc.),
- **learner metacognition** (sense-making, reflection tasks, discussion with others, etc.),
- **collaboration** (discussion, peer-to-peer engagement); and,
- **actively presenting material rather than just receiving it** (summarizing, preparing to present to others).[70]

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63 Bransford et al., 2004; Darling-Hammond et al., 2017; Deans for Impact, 2016; Ingvarson, 2005; Archibald et al., 2011; Trivette et al., 2009

64 Morris et al., 2005

65 Trivette et al, 2009; DeLozier & Rhodes, 2016

66 Means et al., 2009, Broadbent, 2017

67 Burke et al., 2005

68 Darling-Hammond et al., 2017

69 Bransford et al., 2004; DeLozier & Rhodes, 2016

70 Darling-Hammond et al., 2017; Deans for Impact, 2016; Ingvarson, 2005; Archibald et al., 2011; Trivette et al., 2009; DeLozier & Rhodes, 2016

Active Learning in Action:

What should we look for in potential platforms? It is particularly important that online approaches do not simply replicate passive formats employed in traditional settings (e.g. lecture); the more active the modalities and tasks, the better. Consider the following mechanisms for active engagement with materials:

- Embedding reflection and engagement tasks during content provision
- Including interactive design components (e.g., video, assessment tasks)
- Asking learners to try out or demonstrate learning in application (e.g., filming practice in action)
- Encouraging collaborative reflection, inquiry, and projects
- Offering spaces for discussion, such as forums

Read more about how these features are currently operationalized in different platforms and learner experiences.

Mastery Learning

Effective learning experiences focus on working towards proficiency through long-term cycles of practice, assessment, and feedback. While the aim of professional learning is change in student outcomes through changes in teacher practice, too often professional development experiences focus on time-on-task rather than mastery (e.g., continuing education credits by the hour rather than by demonstrated skill). Platforms offer the opportunity to shift from one-time, disconnected learning experiences to a focus on practice and achievement of mastery.

Research-based components that support learning for mastery include:

- **Sustained learning opportunities, where training and content learning is offered at multiple points for engagement around concepts**[71]. Teachers should have the opportunity to engage in learning and application over time.
- **Offering opportunities for deliberate practice**, or individualized training activities specially designed by an expert (coach, teacher, instructor, etc.) to improve specific aspects of an individual's performance through repetition and successive refinement of a given skill[72]. Deliberate practice occurs at an individual's zone of proximal development[73] and offers learners the opportunity to practice translating a model or theory in their classroom in a low-stake but authentic way[74]. Such practice is highly specific and coached; tasks can include role-playing[75], video analysis, simulations, and rehearsal[76].
- **Feedback for improvement**. High-quality, actionable, and prompt feedback that supports learner reflection and provides an objective measure of mastery is an essential feature of good training[77]. In online settings, consistent feedback[78] that is individualized[79] is strongly associated with learner persistence and feelings of connection[80]. Group reflection on instructor feedback or peer feedback is an effective method of reflection as well[81].

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71 Ingvarson, 2005; Archibald et al., 2011; Darling-Hammond et al., 2017; Trivette, 2009
72 Ericsson & Lehmann, 1996
73 Vgotsky, 1978
74 Deans for Impact, 2016
75 Darling-Hammond et al., 2017
76 Deans for Impact, 2016
77 Ingvarson, 2005; Archibald et al., 2011; Darling-Hammond et al., 2017
78 Ivankova & Stick, 2007
79 Bocchi, Eastman, & Swift, 2004
80 Dunlap & Lowenthal, 2014
81 Trivette et al., 2009

- **Assessment of mastery**. Engaging learners in a process of self-assessment of their performance using some type of conceptual or operational framework proved to be a practice that resulted in the largest sizes of effects between the adult learning method characteristics and the learner outcomes[82]. Assessment can be ongoing and formative (which has been shown to increase online learning performance)[83]. Online learner satisfaction is also increased by "end-of-course" assessments[84]. Diagnostic assessments can also be helpful for activating knowledge and placing learners appropriately on learning pathways.

Mastery Learning in Action:

What should we look for in potential platforms? Platforms should:

- Support assessment of and content alignment to clear objectives and mastery goals
- Offer multiple opportunities for engagement with content and a specific skill over a sustained period
- Offer mechanisms for individualized coaching and support
- Include mechanisms for practicing deliberately with feedback and support

Read more about how these features are currently operationalized in different platforms and learner experiences.

82 Trivette et al., 2009
83 Roediger et al., 2011
84 Ho & Dzeng, 2010

Factors that Increase Engagement: Connection and Personalization

Given that online, asynchronous learners report greater challenges in maintaining engagement, the research suggests that an increased emphasis on social connection and personalization can help increase motivation, which is a significant factor in learner engagement and goal achievement — online and offline[85].

Connection

Social learning takes on even more importance in online settings. Peer learning and the building of community is vital to teacher learning and identity development[86]. Given the nature of online interaction and media[87], online students report greater levels of isolation and missing the social presence (the sense of being perceived as real and perceiving others as real) that they more easily establish in face-to-face courses[88]. This social presence is vitally important in online education because it sets the climate for learning to take place[89]. It's not surprising, then, that online environments that foster greater peer-to-peer learning and interaction are associated with higher learner satisfaction, perseverance, comfort, and learning outcomes[90].

The research indicates that:

- **Connection with the lead teacher or expert through online presence and immediacy is significantly important for a number of outcomes**, including perseverance and satisfaction[91] as well as cognition, motivation, and affect[92]. Learners report that responsiveness and complete/timely communication with instructor is critical[93]. Students report significantly lower teacher presence in asynchronous online experiences than synchronous ones[94], though strategies such as asynchronous audio and video postings help significantly[95].
- Given all of this, **online interpersonal connections and community must be carefully constructed and facilitated, as they rarely form organically**[96] and often require greater facilitator involvement[97]. Interactive and ongoing cohesive communication are needed to build social presence and a community of learners[98], which requires purposeful design and cultivation. (For example, even factors like discussion group size affect interaction; designers recommend creating bounded smaller groups even in larger learning communities[99]). Finally, offering blended opportunities in addition to online e-learning can enhance feelings of community and inclusion[100].
- **Designers must integrate features that support social presence**. A key challenge in online interactions is the lack of nonverbal behaviors and cues; for this reason, designers need to explicitly build mechanisms, "nonverbal

85 Goslin 2003; Lim & Kim, 2003
86 Vgotsky, 1978; Bransford et al., 2004; Darling-Hammond et al., 2017; Archibald et al., 2011
87 Short, Williams, & Christie, 1976
88 McInnerney & Roberts, 2004; Stodel, Thompson, & McDonald, 2006; Joksimovic et al., 2015; Barber, King, & Buchanan, 2015; Fletcher & Bullock, 2015; Macia & Garcia, 2016
89 Caspi & Blau, 2008
90 Swan, 2001; Choi, 2016; Müller 2008; Liu, Gomez, & Yen, 2009, Holder, 2007; Ivankova & Stick, 2007
91 Tomas et al., 2015; Joksimovic et al., 2015
92 Baker, 2010
93 Aragon & Johnson, 2008; Bunn, 2004
94 Baker, 2010
95 Ice et al., 2007; Clark, Strudler, & Grove, 2015
96 Wilson et al., 2004; Lock, J., 2006
97 Community for Advancing Discovery Research in Education, 2017
98 Rourke et al., 1999
99 DeLozier & Rhodes, 2016
100 Rodrigo & Nyugen, 2013

surrogates"[101], and norms[102] that help build better communication and connection. The use of "paralanguage" (emoticons, memes, gifs) is a surprisingly effective means for humanizing interactions, creating a sense of community, and increasing satisfaction[103]. Paralanguage use, however, needs to be explicitly encouraged and modeled appropriately by instructors[104].

Connection in Action:

What should we look for in potential platforms? Probe deeply into community assumptions and functionalities. It's not enough to build a discussion board; ongoing collaboration and engagement with peers and teachers should be a core part of learning design. Functions that build social presence and engagement as well as allow instructors to easily engage in an ongoing manner should be present. Some examples include:

- Video conferencing and commenting
- Audio coaching and commenting
- Creation of smaller, bounded communities, including cohort-based groupings
- Features that create opportunities for use of paralanguage
- Chat functionionality
- Moderated discussion forums

Read more about how these features are currently operationalized in different platforms and learner experiences.

Personalization

How learners are motivated differs across individuals and cultural contexts[105]. Further, adult learners need greater flexibility, with the timing and nature of professional development tasks informed by the competing demands on time[106]. Personalization through learning platforms offers significant opportunity to deliver professional development that is aligned to the needs and preferences of adult learners[107].

The research indicates that:

- **Personal goal setting and individualized support improves learner perceptions and outcomes**. By offering higher levels of customization, individualization of content, feedback, timing of learning, and goals, individualized approaches can increase motivation, perseverance, a feeling of social presence, and commitment to completion[108] as well as practice change[109]. Focused, individualized, tailored online content provided in response to specific needs has been shown to be an effective strategy for producing change, particularly in settings serving more students who are considered to come from high-poverty households[110].
- **Designers must support teachers to reflect on, activate, and assess prior knowledge** individually prior to instruction[111].

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101 Derks, Bos, & Grumbkow, 2007
102 Dunlap et al., 2016
103 Rourke et al., 1999; Stein, Wanstreet, & Calvin, 2005; Moore, 2013; Dunlap et al., 2016
104 Vrasidasa & McIsaac, 1999; Weiss, 2000; Woo & Reeves, 2008; Dunlap et al., 2016
105 Lim, 2004
106 Community for Advancing Discovery Research in Education, 2017; Ivankova & Stick, 2007; Nash, 2005; Müller, 2008; Bunn, 2004
107 Knowles, 1980; Ross-Gordon, 2011
108 Bocchi, Eastman, & Swift, 2004; Ivankova & Stick, 2007; Park & Choi, 2009; Dunlap & Lowenthal, 2014
109 Darling-Hammond et al., 2017
110 Pianta et al., 2015
111 Trivette et al., 2009

- **Perception of course relevancy is reported as the top factor that motivates students to engage with and persevere** during online learning experiences across students, regardless of previous online learning experiences, national orientation, gender, and academic and work background[112]. Learning experiences should allow for choice in learning opportunities based on interest and motivation as well as specific classroom experiences and needs[113].

Personalization in Action:

What should we look for in potential platforms? Platforms should be assessed on dimensions of personalization through:

- Mechanisms for supporting learner goal setting and monitoring (as supported by mastery data and shared objectives)
- Meaningful learner choice-making options (around content, pathway, etc.)
- Flexibility to tailor to individual needs

Read more about how these features are currently operationalized in different platforms and learner experiences.

112 Lim & Kim, 2003; Lim, 2004
113 Trotter, 2006

Taking It Into Practice: Tools For Your Own Reflection

So, how can adult learners and the people who support them translate these ideas into their decision-making and work? There's no one right tool or platform — making the "right" choice will depend a lot on the goals of the learner and context of implementation. But by designing with these quality factors in mind and selecting for them in the products, teacher learners and professional developers alike can leverage research-informed practices.

Questions for team reflection before selecting or designing any professional learning tool or platform:

1. What are our goals for teacher learning and why do we believe an online tool can help?
2. What will our implementation context look like? Do we plan to blend online and offline learning experiences? Will we expect teachers will learn in teams?
3. What existing tools or resources are our teachers using? Do we want to design or leverage our own content?
4. Do we plan to select multiple tools? Or are we hoping to use just one?
5. What's our budget?
6. How will we define "success?" How will we know if we've implemented well? How will we know if teachers are achieving mastery?

Questions to guide assessment and selection of a tool or platform:

The table below is designed to serve as a guide for assessing whether or not and how a given tool or product integrates quality drivers into its design and functionality. The sample questions are intended as examples and to elicit additional thinking and inquiry in each driver area. (These same questions can be used by instructional designers as they develop tools, approaches, and content.) Want an editable version? Find it here.

Quality Driver	Questions to Consider	Assessment Notes (Evidence to support your assessment)	Rating 0 (not at all) → 5 (exemplary)
Platform Quality • Perceived ease of use • Effective delivery that reduces cognitive load • Ongoing and accessible support • Flexibility to connect learners to blended/ synchronous modalities	• How easy is it to use? • How do people login? • If we're planning on blending modalities, will it work well for both in-person and online PD sessions? • Can teachers easily find and access training and support? • Does the product meet accessibility and Universal Design for Learning guidelines? • Is it visually inclusive?		

Quality Driver	Questions to Consider	Assessment Notes (Evidence to support your assessment)	Rating 0 (not at all) ➔ 5 (exemplary)
Rigorous Content Focus • Contextually appropriate and relevant based on subject area as well as school/system goals • Content modeling • Meaningful expert scaffolding and moderation	• Does the content match the specific needs of our teachers? (e.g., grade-level, subject, school-wide initiative) • Does it include modeling of practice? (e.g., model examples of practices, including resources and videos) • Has an expert in the content area helped to design and vet the resources? What quality mechanisms are in place? • Does the tool include culturally-responsive content?		
Active Learning • Mechanisms for active engagement with content (including collaboration) • Mechanisms for metacognition • Embedded application • Opportunities to present on as well as demonstrate key concepts in action	• How active and engaging is content on the platform? (e.g., learning beyond lectures and textbook passages) • Can teachers apply their learning in their classrooms? (e.g., incorporating learnings in tomorrow's lesson plan) • Are teachers asked to reflect metacognitively on their learning and progress?		
Mastery Learning • Sustained learning opportunities • Deliberate practice with feedback • Assessment and feedback	• Are there opportunities for teachers to practice and receive feedback? (e.g., multiple choice, coaching) • Are there assessments of teachers' learning? How are teachers going to show their work and mastery of content? • Does the platform support sustained learning over time? (e.g., multiple sessions, looping back and making connections to previous content) • Does the tool support monitoring of learner progress as well as intervention to support?		

Quality Driver	Questions to Consider	Assessment Notes (Evidence to support your assessment)	Rating 0 (not at all) ➔ 5 (exemplary)
Connection • Connection to expert/ teacher • Collaboration with peers • Features that support social presence	• Does it allow for collaboration among teachers? (e.g., working with PLC or paired with a colleague) • Can teachers communicate with one another and experts through the platform? (e.g., tools to chat or comment) • Are there features (e.g., chats, nudges, ability to communicate via video) to support ongoing informal connection and relationship-building?		
Personalization • Activation of existing expertise and knowledge • Personal goal setting and individualized support • Perceived relevance	• Can teachers set goals and track their progress? • Does the platform help teachers identify and build on prior knowledge? • Can teachers make choices about pacing and pathways through content?		

Additional Resources

The following additional resources could be helpful as you and your team take next steps...

- **Link to full research project landing page**, developed in partnership with EdSurge Research, including user and platform stories that illustrate drivers in action.
- **Editable district assessment tool** that supports deeper platform evaluation and evidence-gathering.
- **List of asynchronous learning tools and platforms** identified through the course of this research.

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