"Learning challenges": A framework and practical applications for assessment of deeper learning in online learning communities

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This paper describes a design framework for assessing deeper, connected learning in open learning communities. It begins by defining deeper learning and outlining a case for favoring formative, performance-based assessments over summative assessment. The paper describes the unique ways that online learning environments can operate to support and validate deeper learning through a new model that is in development by the Peer to Peer University platform, called "Learning Challenges." The ideas below are based on a more extensive white paper the authors are working on. A draft version can be found online (link).

A framework for assessing deeper learning

People naturally gravitate to others who share their interests, strengths, and aspirations in order to learn from them, share what they know, and build a sense of identity and community. These communities are often highly specific, and members may be part of the community only briefly (e.g., long enough to solve a problem), or for long periods of time (e.g., as members of a professional association). If you purchase a new mobile phone for example, you might seek others who have one to find out what they know about using it, tricks they have learned, and pointers that might help you. In long-lived communities, people can achieve deeper levels of learning and support through a process of giving and receiving feedback.

Achieving deeper learning in any community thus requires assessment by its members; a process that is strengthened when members become skilled at giving and receiving useful feedback. By "assessment," we mean a set of processes and tools that provide helpful feedback to people to begin or advance their learning and to help guide their contributions to the community. In connected learning environments the assessment of deeper learning requires developing and supporting processes and tools to enable and encourage peers to become resources for each other.

The term "deeper learning" has been used by several organizations--Hewlett Foundation, Educause, Education Week, Alliance for Excellent Education, and others--as a way to highlight higher order learning skills. It has been defined by the Hewlett Foundation (2010) as learning that addresses five groups of abilities:

- mastering core academic content,
- critical thinking and problem solving,
- working collaboratively,
- communicating effectively, and
- learning how to learn independently.

The definition of deeper learning does not offer recommendations on the structure of learning environments that foster the development of these skills. The connected learning framework offers such recommendations. The outcomes of connected learning practices share many similarities with the abilities developed through deeper learning.

Historically deeper learning has taken place within "communities of practice" but traditional settings are hard to scale. These settings often include feedback from an expert mentor as well as peers at various stages of learning. The conservatory, for example, provides an environment for musicians and other performing artists to hone their craft through intensive practice and open critique. Kids might gather

together to learn to ride skateboards, critiquing each other's tricks and trying to impress the group. Research biologists learn at least as much in the lab as they do in the classroom, starting out by cleaning the equipment and gradually becoming more adept at the procedures and ways of thinking that allow for the collaborative endeavor of discovery. Even in industries where apprenticeship has been replaced by more formal training systems, communities of practice and informal assessment and mentoring structures prevail. However, these traditional settings for deeper learning have a relatively high cost and are difficult to scale, limited by the number and size of the learning contexts and the availability of expert mentors. At the same time the shift towards a knowledge economy mean that there is an increased need for the deeper learning that occurs in such environments, and so it is necessary to create structures that support the kinds of intensive interactions of communities of practice, but allow for them to scale organically to serve new social demands.

As the shift towards a knowledge society increases demand for deeper learning competencies, emerging online environments promise to support the kinds of intensive interactions that foster learning in communities of practice, but allow for these communities to scale in ways that was not possible before. Our purpose here is to provide practical guidelines for further design and development of online experiences that support deeper learning. An examination of the literature on deeper learning and analysis of open learning environments and the learning patters in communities of practice online, suggests a set of eight assessment practices that can effectively support deeper learning outcomes.

1. Reveal the contours of the learning community. Assessment provides the structure on which feedback within a community of practice is built. It indicates what body of knowledge is valued, and how this body of knowledge relates to others. It reflects the evolving collective knowledge and expertise of the community regarding what is important and what it means to be an effective practitioner in the community's
domain of knowledge. What is important is assessed.

2. Support rich problems and learning tasks. Items on most current lists of "21st Century Knowledge and Skills" share some characteristics that make them hard to measure with standardized tests. They are complex, they are often multi-disciplinary, they manifest themselves as action-events rather than objects, and the learner has substantial autonomy and purpose in choosing the learning activity. When instruction is atomized, moving to scale often necessitates a move toward shallow assessments: multiple-choice exams and other problems with a single, expected solution. A move from atomized, individual instruction to a learning community makes possible the creation of authentic, complex challenges with a spectrum of potential good solutions.

3. Embrace a diversity of autonomous learners. An open learning environment will have learners in multiple roles including lurker, novice and expert, which allows each participant to find their best fit. In addition, each participant comes with their own motivations, interests, strengths and aspirations for learning and development. An appropriate assessment system provides the flexibility of allowing for multiple paths through the knowledge domain, and supports those learning at different levels of expertise, at different speeds, and within a variety of contexts.

4. Develop assessment as a core skill. The process of assessment--getting and giving useful feedback--is essential to individual learning and the development of a community. Expertise in any area of knowledge requires the ability to effectively analyze and evaluate the work of others, and by extension one's own work, in ways that can provide useful feedback. In many traditional learning environments, formal processes of assessment are left to teachers and other experts and are often conducted in private. In contrast, an open social learning community practices assessment and feedback in public and has

mechanisms for novice members to observe good assessment practices by more experienced members of the community. An open learning environment is an assessment community.

5. Create incentives for participation. Open learning environments are driven by the process of participation, including participation in the assessment and feedback process. This process should both be inviting and easily understood. It should also create incentives for use--both as someone being assessed and as a peer or expert assessor. Some incentives are closely tied to the degree to which helpful feedback is seen as part of the informal community of learning. Assessment structures and practices that invite participation have flexibility "designed in" that respects individual choices, and makes the process of assessment an enjoyable and enlightening experience for peers, participants and the larger community.

6. Provide internal and external validation of knowledge and skill. The assessment structure and practices of a community provide signals or markers of a participant's expertise and experience and create trusted symbols within the community as well as to the external world. In face-to-face communities, such markers can be informal (where someone is allowed to sit, who speaks to whom about what, who proposes or disposes of ideas, for example) as well as formal (job titles, stripes on a military uniform, and other kinds of identity and accomplishment badges) and in most cases are easily observed. Particularly in open, online environments, transparent and easily understood markers of expertise are essential. Those markers must also act as "boundary objects" (Star, 2010), capable of carrying social capital outside the community.

7. Share transparent, authentic artifacts of practice. An effective assessment system provides not only quick understanding of what people know (a certificate, badge or token), but also deep evidence of that knowledge and of how that knowledge was formed. Access to this process is itself an educational resource for learners, as well as grounding the more visible markers of knowledge in a transparent, reliable record. In face-to-face communities, for example, an award is often supported by a written citation that describes the specific works or actions that led to the recognition.

8. Include mechanisms for its own evolution. Knowledge in an open community of learning is essentially local; that is, it is continually determined by the community as it practices using the knowledge to solve authentic problems. The validity of the assessment system requires that it be generated by the community and that it be open to continual improvements. The community engages in a meta-learning process about its own knowledge and identity. This includes not just improving the validity of the assessment instruments--ensuring that the assessment measures what the community values--but also tracking the changing body of knowledge on a continual basis so that the assessments reflect the current state of the art, as well as the community's collective valuation of elements of that body of knowledge.

"Learning Challenges", a practical application

Based on the above framework, P2PU has designed a new online learning model called "Learning Challenges" that aims to effectively support deeper learning outcomes. It provides an embedded assessment framework that supports problem-based learning and can scale to thousands of learners. Featured in this paper are some key features that are in development in the Peer to Peer University platform (p2pu.org.)

"Learning Challenges" start with definition of a complex problem that has multiple possible solutions. Background resources and access to more advanced peer-learners and mentors provide scaffolding for the user's progress. These challenges are complex, often multi-disciplinary, manifest themselves as

action-events rather than objects, and give a learner substantial autonomy and purpose in choosing learning activities. "Learning Challenges" facilitate collaboration between users, and make use of more advanced users to provide support and mentoring to those who follow.

Learning Challenges are built around four key features:

1. Tasks

Users learn most effectively when they are actively making objects that are useful in the real world. The process of "making" something is structured within learning tasks as an embedded way for a learner to showcase expertise. Tasks involve collaboration, allow users to take on different roles (such as guide, innovator, supporter) and foster independent research. Ideally, tasks involve prototyping, experimenting, revising, and iterating. The completed objects make it easier for a learner to demonstrate mastery in complex fields. Tasks can be interactive including video tutorials and games. Moreover, tasks can be grouped in "The Studio" a space for peers to share projects they are working on through four phases that embrace critical collaboration and giving feedback to each other. The first phase is "brainstorming and design," were peers can work together on ideas; the second phase is "prototyping," were peers can create models of their ideas and share with the community that gives them feedback; the third phase is "iterating," where multiple revisions occur; and finally "evaluation" of the best projects. (Appendix, Image 1.0)

2. Discussions

In order to engage learners in conversations that are meaningful and go beyond mere commenting, "Learning Challenges" support a "Discussions" section that allows users to share work, ask a question and most importantly start a debate. The debate tool can play an important role in assessment in both formal and informal ways. An informal example is when someone asks the crowd "Do you think this thing I've made addresses all the main criteria? Here's is why I think it does..." and when friends like it, comment on it, or add ideas. At a formal level, the same tool can provide a debate and response to formal scoring of an artifact or piece of evidence, if desired (Appendix, Image 2.0).

3. Badges

"Learning Challenges" enable the awarding of different types of **skill badges** that recognize a user's motivations, practices, or achievements and aspirations with respect to a particular topic or content area. Additionally, included are a set of **community badges** that recognize and incentivize connected learning practices in online learning communities. The badges earned in "Learning Challenges" are certified by various stakeholders and are shared via the Mozilla Open Badge Infrastructure to a learner's personal website, online profiles, and personal resume. The Open Badges framework is a way to record, track, and display your skills and knowledge across the web. The project team has been one of the original pioneers in the online learning badges world, helping develop the original concept and creating some of the first implementation prototypes.

A) Skill badges

Skill badges can be tailored to a particular content area or learning community: for example, a mobile game development project would define badges related to different programming skills such as mastery of the language "Objective C". However, skill badges are not confined to "hard skills"; they can also recognize 21st century skills such as problem solving or critical thinking. A detailed rubric for each badge guides the review process that leads to the badge. Skill badges hold value within a particular learning community, but signal achievements outside of that community. These are badges that are likely to end up on resumes and job applications.

Skill badges are awarded through a peer-review process that requires the involvement of users who have higher levels of expertise (e.g., mentors or users who already received the badge). Obtaining the badge unlocks the ability to participate in the awarding process. As the community grows, more users become eligible to participate in the assessment and badge awarding processes.

B) Community Badges

In Learning Challenges users develop assessment as a core competency. The habit of assessing peers' work by giving feedback is an act of "critical friendship" that develops higher abilities of observation and analysis while helping others improve. Users identify and copy acceptable practices and terminology, and they learn to improve their own work by giving useful critique to the work of others. Community badges are one mechanism that explicitly develops review and feedback between users.

In addition, each badge signals a particular "role" that the user is taking within the community. Community badges are awarded by community members to each other or automatically by the system based on trackable behavior of a user: for example, logging into the site at least 5 times in the last week, or answering 3 questions from others learners, which gets you "The Answering Machine" badge. Additionally it might be useful to consider negative roles within the community as well; for example, a non-active user is given a "Tourist Badge" (Appendix, Image 3.0).

4. Mentorship

In "Learning Challenges" peers grow to become mentors. As they enter the P2PU community they are encouraged to take on the role of community members by embracing acceptable practices and terminology, and they learn to give useful critique to the work of others. Features such as "Discussions" and "Community Badges" are two mechanisms that explicitly encourage review and feedback between users.

Once a peer has completed a set of learning challenges acquiring badges that demonstrate mastery in a specific field, they have the opportunity to "level up" in the community by taking on the role of a P2PU Mentor. As a P2PU Mentor, one is required to guide peers on a one-on-one level by helping them discover ways to grow as learners. Those joining the P2PU mentorship program go through an initiation process by a P2PU Veteran, someone who has been a mentor for a long time. Additionally, mentors are assessed by their mentees as well as the system, which displays to mentees a mentors' response rate, how fast they answer questions and review work submitted.

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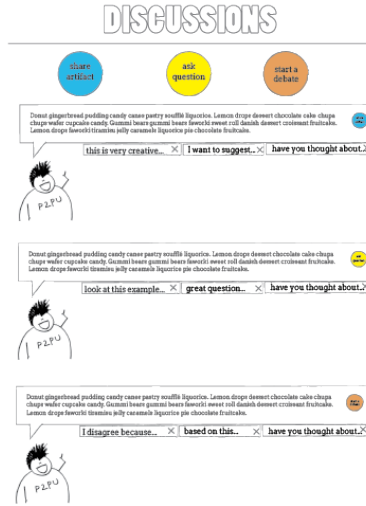
Appendix

Image 1.0
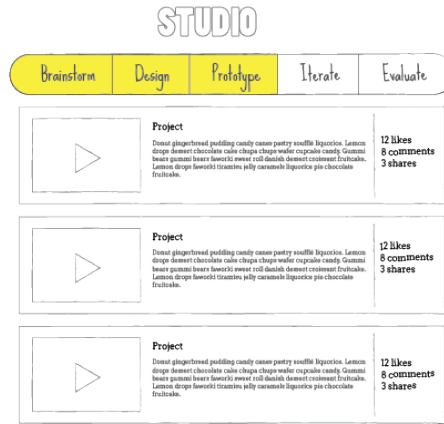
Peers can use the Studio as a "making" space for critical friendship.
Feature under development.

Image 2.0

Peers can share a project, post an idea or start a debate in discussions
They can use the discussion tags to give feedback when writing a comment or reading it.
Feature under development.

Image 3.0

BADGE SUBMISSION

WHAT

Donut gingerbread pudding candy canes pastry soufflé liquorice. Lemon drops dessert chocolate cake chupa chups wafer cupcake candy.

HOW

Requirements to get the badge:

You need 3 peers to give you a rating of ⭐⭐⭐⭐

Challenges you can take this badge in:

Work from peers who have this badge:

SUMBIT A LINK TO YOUR WORK

REFLECTION QUESTION#1

CHOOSE A MENTOR TO REVIEW YOUR SUBMISSION

70% responsive

Save Draft   Submit

BADGE ASSESSMENT

WHAT

Donut gingerbread pudding candy canes pastry soufflé liquorice. Lemon drops dessert chocolate cake chupa chups wafer cupcake candy.

HOW

Requirements to get the badge:

You need 3 peers to give you a rating of ⭐⭐⭐⭐

Challenges you can take this badge in:

Work from peers who have this badge:

LINK TO WORK

REFLECTION QUESTION#1

Donut gingerbread pudding candy canes pastry soufflé liquorice. Lemon drops dessert chocolate cake chupa chups wafer cupcake candy. Gummi bears gummi bears fruitcake. Lemon drops faworki tiramisu jelly caramels liquorice pie chocolate fruitcake.

RUBRICS

| Chocolate cake chupa chups wafer cupcake candy. | ⭐⭐⭐⭐ |
| Chocolate cake chupa chups wafer cupcake candy. | ⭐⭐⭐⭐ |

SUGGESTIONS   I want to suggest... ✕   have you thought about.✕

Save Draft   Submit

Peers can look at others work to inform their submission and request specific mentors to review their work
When assessing another peers submission, peers can use rubrics and make suggestions using "feedback tags."
Feature under development.