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Highlights of the Expert Meetings

From June 2011 through February 2012, three expert meetings with a total of 25 senior researchers were convened: at the Exploratorium in San Francisco, at Northwestern University in Evanston, Illinois, and at the University of California at San Diego (see appendix A). The participating researchers brought rich experience with project design and development, assessment and outcomes research, and external evaluations of programmatic initiatives across a wide range of informal learning settings. We included scholars with experience in conceptualizing and theorizing learning and assessment as well as those whose primary focus is conducting empirical research.

The participants shared pertinent readings in advance of each meeting, and all materials were collected cumulatively on a project wiki. Together we viewed videos of learning in diverse settings and sought to connect our conceptual discussions to these concrete examples. We also sought and received from the meeting participants suggestions on significant research projects (both completed and in progress), names of other leading researchers to consult, and citations to relevant reports and published literature. This effort resulted in a bibliography (see appendix B), which is more extensive than the list of studies chosen for

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review in the previous section, and it also resulted in a list of other relevant resources, including Web sites (see appendix C).

To focus the scope of the report in relation to available project resources, we collectively decided to locate research related to four primary types of settings: after-school programs, community-based organizations, museums and science centers, and online communities. This focus meant that we consciously excluded learning in the home through everyday activities or activities not specified by the requirements of some other educational institution (e.g., doing and discussing mathematics during home remodeling). We also excluded team sports (both live action and "fantasy," or virtual-world mediated) and both online and offline hobbies communities (such as those dedicated to cooking or crafting, such as Ravelry.com).

Certain themes recurred with varying nuance throughout the meetings, such as the affective dimensions of learning, learning at project and group levels, new modes of documentation, digital technologies in assessment, trajectories of learning over time, and the diversity of kinds of valued outcomes.

One of the key issues organizing our approach was that of the *unit of assessment*. The consensus of the group was that this unit is a system over time that includes individual learners, other participants, mediating tools, semiotic media, and local conditions directly relevant to and supportive of the learning activities. Such an analysis must extend to wider contexts that make the setting of learning possible institutionally, but with decreasing detail as relevance to the specifics of learning trajectories decreases.

This type of approach was later applied to the question of metadata or backstories for *video records of learning activities*. A critical issue, the answers to which may vary by type of setting or

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type of activity, centers on how much and what kinds of information are relevant to identifying valued learning and the specific aspects of activity that support it as seen in any given video.

In any records of learning activity over time, some valued learning may be more readily visible to more observers and with less detailed analysis or less experienced professional vision, whereas other instances may be less readily visible. Different kinds of learning may become visible when records of learning activities are studied over longer rather than shorter periods. One way to estimate the role of background information is to have a group view the video first without background, view it again with partial background, and then view it a third time with much more complete background.

However, video alone is often not a sufficient documentation of learning activity because of the inferences that must be made to identify valued learning. Ideally, video should be supplemented by field notes from participant observation or observant participation, interviews with participants, and relevant histories of the setting and the participants. Documentation should cover activity in a setting for a period long enough to show the origins of participation, the evolution of the activity, the learning in the activity, and the consequentiality of learning for some other activity. An individual episode captured on video may be significant as part of a longer trajectory of learning and development, and/or as an instance of a frequently repeated pattern of learning and activity in other cases in the same or similar settings. Video can be a useful tool for documenting an important learning event that is recognized retrospectively.

Another key issue in the meetings was identifying the criteria for the *value of and significance of learning*. A primary criterion is that there is evidence of value for the participants, such as the

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length of time they focus on a task or activity, their reluctance to leave or end the activity, their displays of intense or positive affect during the activity, and any comments on the activity during and after explicitly elicited evaluations.

Beyond this, there are additional criteria that may be applied, such as the judgment of expert educators or others (such as parents) on what is of value to the learners and/or to society and any evidence of consequentiality of learning for more conventional academic activities (e.g., increased interest, increased participation, more positive affect, more effective completion of tasks, the ability to teach content and skills to others, or the ability to solve problems collaboratively).

In order to do *assessment across settings*, cumulatively or comparatively, we need to identify features, factors, or considerations that traverse the boundaries of the settings. Many common assumptions about this are flawed—identities change across settings, and so do modes of learning, purposes, and what is valued from the learning activities. Moreover, communities are not bound, fixed entities but are abstracted from the flow of practices among participants in many communities. Learning cannot be defined as progress toward mastery in a community, given this fact. Consequently, efforts to *fully* assess the effects of learning experiences must be based on longitudinal, ethnographic records, such as collections of material objects and semiotic products with in-progress versions over time.

New and promising approaches may prove to be particularly helpful in better understanding the diverse, widely distributed, and interrelated nature of learning experiences. New or underutilized methods include digital storytelling as a mode of documentation, spatial tracking, agent-based modeling, longitudinal assessment over periods of 5 to 10 years, the tracking of learning

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across programs and settings, the collection and sharing of data about learners across programs, data mining, machine-learning analysis, and richly instrumented spaces.

Many researchers are now orienting to indices of affective engagement, such as interest, commitment, and persistence, because these are assumed to be common across settings and therefore important for wider assessment. Others see the relationship between learning experiences and the possibility of taking up subsequent opportunities as the critical element for assessment and look to measuring changes in the distribution of practices across networks as evidence of system-level learning (including individual learning).

The meeting participants noted the importance of *understanding learning communities* in order to adequately document, assess, evaluate, and research them. Learning communities may differ from one another in their basic goals and values, strategies, and organization of learning as well as in the roles they make available for members and the new niches members may create for themselves in the community.

Learning communities also differ in how outcomes for individuals, groups, and the communities as a whole are negotiated or established, and therefore such outcomes must be documented, assessed, and evaluated relative to the different goals and values (e.g., those of individual participants, those the community considers appropriate to various roles, those of the group and community itself, and those of external entities such as sponsoring organizations).

Informal learning communities often differ from school-based learning groups in the degree to which learning outcomes are unpredictable—in addition to other differences such as age

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mixing, flexible pacing, division of labor and goals according to role, self-guided learning, and voluntary participation.

Within many informal learning communities, learning goals focus on the drivers of learning more than on the learning of specific content. These communities aim to improve motivation, engagement, and enjoyment; to broaden areas of interest and expand zones of comfort; and to improve the skills of self-guided learning, sustained learning, and collaborative learning. Some communities and some roles may emphasize activities that the participants already value and enjoy, whereas others may draw the participants out of their comfort zones to expand their know-how and its range of mobilization. Some learning communities are also organized in such a way that groups and the community as a whole learn and change over time, whereas others are organized mainly to facilitate individual learning.

The meeting participants engaged in an extensive discussion of *badges as a means of recognizing achievements* both in nontraditional settings and in relation to the kinds of know-how for which there may not be formal recognition systems. Badges used within communities, awarded by each community and its members, serve both to recognize achievement and to make the achievers recognizable to others as potential sources of expertise and assistance. Badges can also help to define ladders of participation, which indicate for the learners the existence and nature of higher levels of skill. The value of a badge depends on the reputation of the community awarding it and the procedure by which it is awarded, especially if the badge is to operate and be recognized outside a specialized community.

Badges are an example of the crowdsourcing of assessment. Within a community, this mode of evaluation and recognition may indicate community or group consensus rather than an

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exercise of power and thus avoid some of the resistance-based invalidation of other forms of evaluative judgments. But if a wide-scale system of endorsement of badges or badge awarders (e.g., by government authority) prefers its own criteria of value to those of the awarding communities, it could undermine the authenticity of badges as endogenous evaluations and trigger the same reactions and invalidation seen with traditional external power-based evaluations (e.g., grades, standardized testing).

Such an occurrence could lead to badge-seeking without engagement, badge inflation (lowering the perceived and practical value of the badge as well as the criteria for awarding it), and efforts to obtain badges without durable, mobilizable learning.

We see manipulation or degradation in recognition systems today with the relatively low standards for accreditation in the for-profit sector of higher education, the purchasing of institutions with already accredited programs, the likelihood of bribery, and so forth. It is not clear what the likely effects on an open badge system would be if badges were awarded by for-profit institutions or organizations as a source of revenue. This should be a major concern.

Another issue raised was the difference between *localized and interoperable means for assessing learning*. Some methods of documentation and procedures for assessment produce value insofar as they are designed specifically in relation to the goals and practices of a particular community. Other methods and procedures can be used equally well for different projects and thus support comparisons and generalizations. It is important to balance these approaches in relation to the goals of local improvement and generalizable knowledge.

For example, a coding scheme to identify a particular category of events in a video archive documenting a project may

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focus on types of events that are highly specific to that project and its goals and that may not be in evidence or be relevant to any other project; or it may try to focus on types of events that are very likely to occur in other projects and be relevant to a wide range of goals. It seems desirable to try to include both kinds of focus in assessment.

This example highlights the need to balance the goals of assessment (improvement) and the goals of research (knowledge relevant to future design). But the relation is not as simple as might be imagined. In-depth assessment of a project on its own terms may be of enormous value for research purposes insofar as it produces knowledge about how particular outcomes were achieved, what worked and what didn't, what was sustained over time and what got changed, and so on.

This knowledge can potentially be combined with similar knowledge from other projects to improve future designs, even if it was not itself set up for this purpose. Likewise, existing research-based generalizations can be localized to serve the needs of assessment and improvement for particular projects (and in general they must be localized to be effective).

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