

COMMON REASONS PROPOSALS ARE NOT RECOMMENDED FOR FUNDING

FIT WITH PROGRAM

Not appropriate to the mission of the Cyberlearning Program: The Cyberlearning and Future Learning Technologies program is a research program. The mission of the program is to fund efforts that will help society envision the next generation of learning technologies, learn how to use them well to enhance learning, and advance what is known about how people learn or how to foster or assess learning. The next generation of learning technologies refers to technologies that will commonly be used 10 to 20 years from now to support learning, whether in school or out of school, and among all the different segments of the population. Most PIs who are told their proposal does not fit the mission of the Cyberlearning Program are being told that they are not thinking far enough into the future, not being imaginative enough about what technology could do, or not addressing the full mission of the program.

Lack of an innovation/proposed innovation does not represent a new genre: Proposals should propose to learn about the design and effective use of some new genre, or type, of learning technology or sociotechnical system in support of learning. Some proposals instead propose a particular app or implementation as their innovation. The app or software to be implemented and refined in a Cyberlearning proposal should be representative of the new genre but does not itself count as an innovation.

Proposed innovation not informed well enough by the research literature: Important to the vision that forms the foundation for the Cyberlearning Program is that the best learning technologies of the future will be informed by what is known about how people learn, how to foster learning, how to assess learning, and how to design for learners. The solicitation (referenced above) includes several citations from this literature; in general, we expect innovations to be informed by what is known about processes involved in learning and influences on those processes; there is a large scientific literature that might be drawn on.

CLARITY AND SPECIFICITY

Not clear exactly what will be built: As specified in the solicitation, it is important that proposals make clear the design features and/or functions of their proposed innovation and how those are informed by what is known about learning. To judge whether a project is worthy of funding, reviewers need to know what will be built and what evidence proposers used to make their design decisions. Reviewers also need to know what will be built to understand the proposed experiences of learners and to judge the potential of the technology to foster learning.

Not clear exactly how it will be used: Similarly, reviewers need to know how PIs expect an innovation to be used to judge its potential as a learning technology.

Not clear what the intended learner experience will be: Reviewers can judge the potential of a new technology to foster learning and make a real difference only when they can grasp what the experiences of learners will be. For this reason, we allow up to 5 proposed screen shots to be included in

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Supplemental Documents. Usually, reviewers need this full set of screen shots as well as a walk-through (in the proposal) of the expected learner experience. The walk-through should refer to the screen shots that are included in Supplemental Documents.

Not clear what has already been done/built and what will be done during the project: Most projects build on work that has already been done. This is just fine, but reviewers can judge how realistic a work plan is only if they know what is already implemented or known and what still needs to be done. This works both ways; if not enough is done already, reviewers often judge a project not doable, but if the work is mostly done, they often wonder why research money is needed.

Insufficient detail overall: NSF proposals go through a rigorous merit review process before recommendations are made about funding. Peers (researchers from throughout the world) are asked to review proposals for their intellectual merit and potential broader impacts. They judge how well a proposal builds on what is already known, how important the proposed work is, and how well they think the PIs have done at putting together a plan for achieving the proposed goals. Funded proposals usually have a lot of detail about the theory investigators are building on, what they propose to do, and the methods they will use. Without that detail, reviewers can only guess at what a PI is proposing to do. Reviewers expect the detail to be provided in the vocabulary of the scholarly literature.

RESEARCH AND DEVELOPMENT PLANS

Lack of a plan for iterative refinement: No proposed design ever works exactly as planned. The development plan for a Cyberlearning innovation should therefore be laid out as an iterative refinement. PIs should make clear what issues they anticipate they will need to address in refining their initial designs, the observations they will do and data they will collect to understand the strengths and weaknesses of their technology, the analysis they will do of that data, and how they use what they learn to refine the technology or the way it is used.

Lack of research questions: Another important part of the mission of the Cyberlearning Program is to advance what is known about learning, i.e., to contribute back to those literatures that are informing the designs of the next generation of learning technologies. We ask in the solicitation that each proposal list research questions whose answers will contribute to theory about learning, fostering learning, assessing learning, or designing for learners. We ask that questions be phrased as questions and that rather than being yes/no questions, they should ask why, how, to what extent, or under what conditions. As well, the solicitation distinguishes between research and evaluation; research adds to theory, while evaluation tells you how well your particular implementation is working. As a general rule of thumb, research questions should ask about learning processes, influencing learning processes, learning outcomes, and/or assessing learning processes when some conditions are met. Questions that ask about the implementation or enactment itself are generally better seen as evaluation questions that, when addressed during iterations will inform refinements, and when addressed towards the end of the project will provide information about the potential for effectiveness of the innovation; research questions go

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the next steps beyond what happened in an implementation or enactment and provide advice that goes beyond the proposed innovation itself.

Research methods underspecified: Reviewers need to know what data will be collected, when it will be collected, and how it will be analyzed to judge the potential for research success. This is especially important for DIP projects, where it is expected that research will answer research questions. For EXP projects, PIs are expected to shed light on the answers to research questions. Methods, therefore, may be quite informal and linked to observations, but it should be clear how PIs expect to shed light on the answers to research questions.

Research methods and project activities are not clearly linked: As the solicitation states, we expect the three parts of each Cyberlearning Program proposal to be linked to each other. The innovation and its enactment should provide the context for both answering research questions that advance what we know about learning and for identifying genre affordances, challenges, and guidelines for effective design and use.

EXPERTISE AND COLLABORATION

Important expertise missing from the team: Doing all that is required in a Cyberlearning project is difficult and requires an interdisciplinary collaborative team. As the solicitation states, teams need expertise in designing for learners, in learning processes, in the technology you are using, in research, and perhaps in other areas. We expect each project team to have all the expertise needed for success; the team should be put in place before a proposal is sent in.

Collaboration plan is insufficient: We expect to see here what the mechanisms will be for senior investigator collaboration as well as for interactions with the advisory board. No proposals were turned down with weaknesses only in this part of their proposals; many, however, had this weakness on top of others. A complete absence of a collaboration plan is grounds for return without review, as it is required by the solicitation.

INNOVATION AND IMPACT

Makes only incremental advances/does not sufficiently advance the field: All projects should be adding to our collective imagination of the next generation of learning technologies AND adding to what we know about learning. Each Cyberlearning Program project should have the potential to make a big difference in the world, sometimes by fostering learning in new and more accessible ways, sometimes by assessing in new and more accessible ways, sometimes by helping learners have new kinds of experiences, sometimes by collecting data that will help us learn things about learning that could not be learned otherwise. When reviewers/panelists state that a project will make only incremental advances, they are judging that the proposed work is not ambitious enough in what it is aiming for to be appropriate for the Cyberlearning program. There are other programs at NSF that have the mission of funding design of learning technologies that will be feasible for use in the near future; one of those

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programs would be a better fit for such a project (though some of these projects will also not be sufficiently ambitious for one of those other programs).

Important issues are not problematized/challenges are not identified: Design of new learning technologies is difficult. The research literature makes suggestions about how to design learning technologies but is not complete in its recommendations. Reviewers want to know that the PIs have some idea about the difficulties they will encounter as they iterate towards a successful innovation and as they try to answer complex research questions. When PIs make it seem like some complex design or research question will be easy to address, reviewers judge that the PIs don't fully understand the complexities in what they are proposing.