

**U.S. Department of Education - EDCAPS  
G5-Technical Review Form (New)**

Status: Submitted

Last Updated: 10/12/11 12:00 AM

## Technical Review Coversheet

**Applicant:** New York Hall of Science (U411C110310)

**Reader #2:** \*\*\*\*\*

	Points Possible	Points Scored
<b>Questions</b>		
<b>Selection Criteria</b>		
<b>Quality of the Project Evaluation</b>		
1. Project Evaluation	20	20
<b>Sub Total</b>	20	20
<b>Total</b>	20	20

# Technical Review Form

Panel #9 - 84.411C Tier 2 Panel - 9: 84.411C

Reader #2: \*\*\*\*\*

Applicant: New York Hall of Science (U411C110310)

## Questions

### Selection Criteria - Quality of the Project Evaluation

1. The Secretary considers the quality of the project evaluation. In determining the quality of the project evaluation to be conducted, the Secretary considers the following factors:
  - (1) The extent to which the methods of evaluation will provide high-quality implementation data and performance feedback, and permit periodic assessment of progress toward achieving intended outcomes.
  - (2) The extent to which the evaluation will provide sufficient information about the key elements and approach of the project to facilitate further development, replication, or testing in other settings.
  - (3) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

Note: We encourage eligible applicants to review the following technical assistance resources on evaluation

- (1) What Works Clearinghouse Procedures and Standards Handbook and
- (2) IES/ NCEE Technical Methods papers.

### Strengths:

The proposed evaluation will include both an implementation study and an impact study. There is an explicit list of evaluation questions to guide the evaluation that are appropriate and address the key issues. Implementation data includes objective data from the games and digital apps providing explicit rather than only impressionistic data. GPA, gender, and ethnicity will be employed as covariates in the impact study, minimizing the effect of significant extraneous variables might could contribute to the outcome. An a priori framework will be employed to guide the coding of responses in the interviews and focus groups. Pre-post student surveys and assessment of science knowledge will employ established measures with demonstrated reliability and validity. The implementation of Rasch measurement modeling has the potential of increasing the precision of the measures employed. Power analyses have been conducted and the minimal detectable effect sizes have already been established. The proposed hierarchical linear model has been specified. A credible logic model has been developed to help guide the evaluation.

### Weaknesses:

I find no apparent weaknesses

Reader's Score: 20

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## Technical Review Coversheet

**Applicant:** New York Hall of Science (U411C110310)

**Reader #1:** \*\*\*\*\*

	Points Possible	Points Scored
<b>Questions</b>		
<b>Selection Criteria</b>		
<b>Quality of the Project Evaluation</b>		
1. Project Evaluation	20	19
<b>Sub Total</b>	20	19
<b>Total</b>	20	19

# Technical Review Form

Panel #9 - 84.411C Tier 2 Panel - 9: 84.411C

Reader #1: \*\*\*\*\*

Applicant: New York Hall of Science (U411C110310)

## Questions

### Selection Criteria - Quality of the Project Evaluation

1. The Secretary considers the quality of the project evaluation. In determining the quality of the project evaluation to be conducted, the Secretary considers the following factors:
  - (1) The extent to which the methods of evaluation will provide high-quality implementation data and performance feedback, and permit periodic assessment of progress toward achieving intended outcomes.
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### Strengths:

Research questions are clearly defined and well written in two different types of questions; outcome and process which are helpful in terms of understanding the planned investigations. It is also clear that both formative and summative information will be available from this evaluation.

The first two years of the study design consist of the implementation study which appears to be largely qualitative and will use teacher interviews, student focus groups and observations as well as performance data (from games/ apps). By using multiple measures from multiple participants (teachers and students), rich informative data will be captured and it is clear that this data will be used appropriately throughout the first two years of evaluation in refining the development of SciGames. In addition, survey and assessment information will be used to address four implementation questions which will provide useful information towards continued development. The implementation evaluation will contain baseline information to capture teacher and student prior experiences which is another strength of the proposal. Finally, the style of qualitative analysis is presented and is appropriate for the data being collected; coding using a framework created prior to coding to investigate hypotheses.

The study design contains both a quasi-experimental design (matched comparison group) in year 3 and a RCT in year 4 and appropriately takes full advantage of teachers who originally serve as matched comparison teachers; a strong design while allowing all participants a chance to experience the treatment condition. This design will also allow for causal inferences in year 4. In line with both the quasi-experiment and the RCT proposed, power analyses were conducted and a minimum detectable effect size (MDES) is identified for each along with the process and assumptions of the calculations so that full evaluation of the process was possible. The process appeared to be conducted appropriately with all assumptions justified and the resulting MDES reasonable and appropriate. In addition, administrative data will be collected and serve as covariates to assure that the most rigorous model is used to evaluate this project. It is apparent from this work that the evaluation has been well thought out and stands on rigorous and statistically appropriate techniques.

In addition, within both years of the impact evaluation (years 3 and 4) hierarchical linear modeling will be used which is appropriate considering the nested nature of the data and the sample size at each level of the nesting that will be explored. This strategy makes this a strong proposal in the analytic sense and has the potential to provide a great deal of information concerning the impacts of the study.

Across both types of evaluation (process and impact) survey measures are clearly defined and referenced where applicable which allows for judgments of the appropriateness of surveys proposed. Also, throughout

both evaluations Rasch analysis will be conducted in survey validation and the possibility of construct level scores will be explored which, if the data determines, is an appropriate step when analyzing survey results. In addition, in the instance that a comparable survey will be given for comparison teachers to complete, the nature of that survey has been described which allowed for an evaluation of the appropriateness of such a comparison.

AIR is a strong choice as an independent evaluator and the reputation of the company is strong. In addition, the AIR staff listed within this proposal [REDACTED] has had experience conducting both experimental and quasi-experimental studies of a large scale; although qualitative experience was not as prevalent. In addition, the evaluation cost (roughly 10% of project cost) is reasonable considering the type of analytic approach, statistical analyses and data collection required over the project.

**Weaknesses:**

Concerning the implementation study during years 1-2, the observation protocol and/or instrument were not described and without such information it was unclear what type of information was going to be gleaned from those efforts; therefore it was also not possible to assess the value of such observations. In this same vein, a draft or example of the a priori coding framework to be used for qualitative analysis would have been helpful in a more detailed evaluation of its appropriateness. In addition, matched comparison schools will be used but the type of matching was not discussed and such information would be needed to ascertain that matching was planned thoroughly and appropriately.

**Reader's Score:** 19

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