# ATLAS Research Fellowship for Doctoral Students

March 3, 2023

Accessible Teaching, Learning, and Assessment Systems (ATLAS) at the University of Kansas seeks proposals from doctoral students to conduct research and evaluation projects in support of our technology-based learning and assessment systems. Doctoral students from accredited US and Canada-based institutions are eligible to apply. Applicants can submit a proposal for either a one-semester project (I.e., fall 2023, spring 2024, or summer 2024) or a two-semester project (I.e., fall 2023 and spring 2024 or spring 2024 and summer 2024).

ATLAS promotes learning by creating accessible and academically rigorous technology-based learning and assessment systems for all students with a special focus on students with disabilities, struggling learners, and their teachers through several projects focused on improving student outcomes.  ATLAS's learning map models, assessment design, and teacher resources are informed by the center's research projects and by innovations in psychometrics that support the measurement of map-based learning. ATLAS fosters partnerships with diverse organizations that share our focus and commitment. Additional information about ATLAS' projects can be found on the ATLAS website (http://atlas.ku.edu/).

Applicants are encouraged to submit a 500-word project abstract via a Qualtrics link by **April 3, 2023**. Abstracts are not required, but applicants may benefit from submitting an abstract to obtain feedback on the proposal, which may strengthen its likelihood of getting funded. Abstracts should include the purpose of the research and research questions, an overview of the proposed methodology, and a description of the potential implications of the research for ATLAS. Applicants who submit abstracts will receive feedback from ATLAS staff.

Applicants must fill out an application and upload a 2,000-word full proposal via a separate Qualtrics link by **May 19, 2023.** Applicants may send questions about the fellowship program, priority areas, or other topics to atlas-aai@ku.edu. Applicants who submit applications and full proposals will be notified of decisions by **the week of June 19, 2023**.

## Scope of Work

ATLAS staff invites doctoral-level students to submit proposals to conduct a research study under the direction of a faculty sponsor from their institution. Applicants must be enrolled in a doctoral-level program in educational measurement, statistics, computer science, evaluation, or a closely related field.

Submission of a proposal includes the application (which includes instructions for including a cover letter and a letter from the fellowship faculty advisor) and a 2,000-word full proposal. The application will include two elements.

1. Brief cover letter expressing interest in the fellowship and providing the following information:

- Graduate-level courses you have completed relevant to your proposal
- Professional or academic experiences relevant to your proposal
- Available resources that will allow completion of your research (e.g., computing cluster)
- Anticipated timeline
- Additional information to be considered for your submission

2. A letter from the fellowship faculty advisor acknowledging their familiarity with the proposal, the fellowship requirements, and their willingness to supervise the work.

The full proposal must include the following: a review of the literature highlighting the gap this proposal seeks to fill, proposed research questions (if relevant), methodology (or methods for systematic literature review if applicable), and a conclusion section that explains the significance of the work. We specifically seek research addressing the priority areas below; however, other proposal ideas relevant to our mission and projects will also be considered.

- Machine learning or analysis of response process or log data for operational educational assessment programs:
    - Exploratory analyses evaluating common process data variables in the DLM population such as:
        - Investigating the relationship between students' response time and teacher support relative to their involvement in the administration process of the assessment
        - Investigating response time and attributes identified through the Personal Needs Profile (PNP), and/or the relationship between students' answer changing frequency and teacher administrative support
        - Evaluation of the impact of missing data and model misfit on estimates of within-year growth for diagnostic models (e.g., using a transition diagnostic classification model).
- Evaluating the sample size requirements for transition diagnostic classification models
- Evaluating the impact of violating the assumption of item invariance for transition diagnostic classification models
- Evaluate the potential for reporting within-year progress at multiple grain-sizes using transition diagnostic classification models
- Developing composite measures and/or teacher-level variables on the DLM Teacher Survey.
    - Background: The DLM Consortium administers an annual teacher survey to collect information about student and teacher experiences with the DLM assessment, opportunity to learn, accessibility, and other topics. One survey is administered per student to be filled out by the teacher to whom the student is assigned in the assessment system, and some of the sections are spiral-assigned such that a random sample of teachers receive different item blocks.
    - The scope of work might include:
        - Principal component and/or cluster analysis of teacher survey data and/or development of teacher-level variables based on responses for multiple students served by the same teacher

- Exploring multivariate relationships between teacher survey data and DLM student performance data.
- Systematic literature reviews:
    - Review of effective models in the design, delivery, and evaluation of online professional development for special education teachers, particularly those models related to asynchronous microlearning.
    - Review and proof of concept simulation for an adaptive test that uses diagnostic classification modelling, including adaptation between short testlets.
    - Review of the connections between cognitive models of learning and memory and Evidence-Centered Design as a method for test development. What current research findings on formal, organized learning models are relevant to developing assessments using principles of Evidence-Centered Design?
    - Review of cognitive complexity models and commonly used taxonomies of cognitive complexity, specifically their relationship with three-dimensional science standards such as the Next Generation Science Standards. The scope might include comparisons among models, adaptations of models for novel applications to complex test constructs and other research findings that may support domain definition and test development.
    - Review and support for mapping cognition for early learning (I.e., preK-2) in ELA, mathematics and/or science

## Funding Periods and Deliverables

Applicants will follow the timeline below for proposal submissions.

| Proposal submission timeline | |
|---|---|
| 04/03/2023 | Abstract (optional) |
| 04/17/2023 | Applicant receives feedback on the abstract |
| 05/19/2023 | Application and full proposal |
| Week of 06/19/2023 | Award announced<br>ATLAS provides feedback on proposed methods |
| 07/18/2022 | Finalized proposals |

Applicants should indicate their preferred funding period. The scope of the proposed work should be commensurate with the funding period.

| Funding Period | Funding Amount | Deliverables |
|---|---|---|
| Fall 2023 | $8000 | Funding period begins (08/01/2023)<br>Monthly progress brief (08/31/2023)<br>Monthly progress brief (09/30/2023)<br>Monthly progress brief (10/31/2023)<br>Final research report and related materials (12/1/2022) |
| Spring 2024 | $8000 | Funding period begins (01/02/2024)<br>Monthly progress brief (01/31/2024)<br>Monthly progress brief (02/29/2024)<br>Monthly progress brief (03/31/2024)<br>Final research report and related materials (04/26/2024) |
| Summer 2024 | $4000 | Funding period begins (05/20/2024)<br>Monthly progress brief (06/30/2024)<br>Monthly progress brief (07/31/2024)<br>Final research report and related materials (08/19/2024) |
| Fall 2023 & Spring 2024 | $16,000 | Funding period begins (08/01/2023)<br>Monthly progress brief (08/31/2023)<br>Monthly progress brief (09/30/2023)<br>Monthly progress brief (10/31/2023)<br>Research progress report (12/02/2023)<br>Monthly progress brief (01/31/2024)<br>Monthly progress brief (02/29/2024) |

| | | Monthly progress brief (03/31/2024)<br>Final research report and related materials (04/26/2024) |
|---|---|---|
| Spring 2024 & Summer 2024 | $12,000 | Funding period begins (01/02/2024)<br>Monthly progress brief (01/31/2024)<br>Monthly progress brief (02/29/2024)<br>Monthly progress brief (03/31/2024)<br>Research progress report (04/26/2024)<br>Monthly progress brief (05/31/2024)<br>Monthly progress brief (06/30/2024)<br>Final research report and related materials (07/31/2024) |

During the fellowship appointment, written monthly briefs will be submitted at the end of each month to update ATLAS staff on progress towards the research goals. For the one-semester project, recipients will submit a final research report at the conclusion of the appointment. For the two-semester project, students will submit one progress report at the end of the first semester and one final research report at the conclusion of the appointment. ATLAS also requires delivery of related materials created during the project, such as data analysis scripts, coding protocols, annotated bibliographies, etc. at the conclusion of the appointment.

The amount of funding is determined by the funding period requested and awarded. The scope of the proposal should be broad enough to allow for approximately 15 hours of work per week for the semester. Applicants should further demonstrate that they have the resources necessary to complete the study in their submission materials (e.g., access to computing cluster). For applicants who apply for the two-semester project, continuation of the fellowship in the second semester is contingent on successful progress during the first semester.

**Half of the funding amount is provided at the beginning of the funding period**, contingent on receipt of the finalized proposal. Remaining funding is provided at the end of the fellowship when the final report is submitted. The faculty sponsor will receive funding in the amount of $1000 per full semester.

In the fellowship application, applicants should indicate their interest in presenting their final project at a virtual meeting. The presentation is optional and will not influence funding decisions.

If the project created during the fellowship is anticipated to result in a conference presentation or publication, ATLAS staff must approve the content prior to proposal submission.

## Proposal Evaluation

Proposals will be evaluated on the following criteria:
- Appropriateness of design
- Evidence of procedural quality and feasibility
- Applicability to ATLAS work
- Demonstrated capacity to conduct the study, including experience conducting similar studies, relevant coursework, or both

ATLAS staff reserve the right to provide directions on submitted proposals prior to awarding funding. ATLAS staff also reserve the right to reject all proposals that were submitted if the above criteria are not demonstrated. Applicants who submit full proposals will be notified of decisions by the week of **June 19, 2023.**