Support for Faculty Scholars Award (SFSA)

Application Form

Applications must be submitted to the OVPR by 5:00 p.m. on the published application deadline. Refer to the SFSA guidelines, available on the OVPR website, for information regarding eligibility, allowable expenses, and other submission details. Applicants must complete each item on this application form. Completed applications are limited to a maximum of 1500 words on 3 pages or less, including any figures, tables, and the budget information. Applications greater than 3 pages will be returned without review. All applications must be signed by the faculty member and the department chair.

Name
Matthew M. Ross

Date
September 26 2016

Department
Finance and Commercial Law

College
Haworth College of Business

Email
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Phone #
387-5952

Faculty rank
Assistant Professor

Title of proposed work
BBA Quantitative Skills: Doubling the Data

Amount requested
$2000

Date and title of any previous SFSA or FRACAA project
None

1. Provide an abstract/succinct summary of the proposal (50 words or less):

   This SFSA would approximately double data collection for the WMU Assessment Fellows Grant titled "BBA Quantitative Skills: Assessing the Prerequisites". Data collection currently covers only Fall 2016 while the SFSA would add Spring 2017. This additional data would dramatically increase statistical power, facilitate more advanced analysis, and increase publication potential.
Application narrative: Items 2 – 6 cannot exceed 1,500 words on 3 pages or less

2. Describe your proposed work (e.g., objectives or goals, activities, timeline, outcomes, products, or other relevant information), including the connection, if one exists, with any previous SFSA or FRACAA project.

Quantitative skills are essential for successful completion of the Bachelor of Business Administration (BBA) program. However, preliminary assessment indicates that Haworth College of Business (HCoB) students may lack necessary prerequisite algebra skills to be successful in the HCoB BBA program. The SFSA would allow data required to analyze this issue in much greater detail.

Specifically, we collected data in three steps for the WMU Assessment Fellows Grant: (1) On the first day of class (FIN 3100) participants completed the short Attitudes Toward Mathematics Inventory (ATMI) scale (e.g., “I have usually enjoyed studying math in school” (rate on a scale of 1-5)) and five open-ended questions related to math (e.g., “What is your worst memory involving math?”), (2) Participants then completed a 10 question math quiz covering BBA prerequisite skills, and (3) WMU Office of Institutional Research extracted academic and demographic data for HCoB students (e.g., overall GPA, ACT math score, age, gender, college major, etc.).

Currently, we are using data in the following linear regression:

\[ Q_i = ACT_i + \sum_{j=1}^{N} Grades_{ij} + \sum_{j=1}^{N} Time_{ij} + \sum_{k=1}^{N} Demographics_{ij} + \sum_{h=1}^{N} ATMI_{ih} + \epsilon_i \]

where Q is a proxy for quantitative skill, ACT is highest ACT test math component score for the student, Grades is the vector of grades prerequisite quantitative courses, Time is the vector of duration since completion of prerequisite quantitative courses, Demographics is the vector of control variables extracted from WMU Office of Institutional Research, ATMI is the vector of Attitudes Toward Mathematics Inventory scale results, and \( \epsilon \) is the error term.

When combined, these analyses will allow us to determine the prerequisite math ability of FIN 3100 students and examine the relationships between a student’s prerequisite math ability and cognitive factors (i.e., ACT math score, GPA), non-cognitive factors (i.e., attitudes toward math, memories about math previous math performance), and demographic/individual information (i.e., age, college major).

If funded, we will complete the procedure described above in FIN3100 sections taught by PI, Matt Ross under the existing Human Subjects Institutional Review Board (HSIRB) data collection protocol. The timeline is as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Activity</th>
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<tbody>
<tr>
<td>JAN17</td>
<td>Collect ATMI and math quiz data in FIN 3100 sections.</td>
</tr>
<tr>
<td>FEB17</td>
<td>Obtain HCoB and participant demographics and academic data.</td>
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<tr>
<td>MAR17</td>
<td>Integrate Spring 2017 data into the Fall 2016 data set.</td>
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<tr>
<td>APR17</td>
<td>Present results at the 8th Annual Assessment in Action Conference</td>
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<tr>
<td>JUN17</td>
<td>Association for the Assessment of Learning in Higher Education Conference</td>
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3. Describe how the proposed work will make (a) a significant and (b) original contribution to the discipline.

The SFSA would expand the study to provide valuable information to help WMU faculty, staff, and administration improve student outcomes. This is the first study to apply selected innovations from math education and cognitive psychology literature to business math. Specifically, this includes use of the attitudes toward math inventory (ATMI) scale and linguistic analysis in conjunction with a rich set of control variables. To the best of the PI's knowledge, these scales and study design are a novel contribution to business math education.

4. Describe the mechanism for dissemination.

These results will be presented to the Haworth College of Business, the College of Arts and Sciences, and institutional organizations at WMU. Initial contact will be with the Assessment Committees of the Finance and Commercial Law, Mathematics, and Statistics Departments. Results will then be sent to the Haworth College of Business Assurance of Learning Council (ALC) so they may consider adding it to the Assessment Report. The Assessment Report is sent to the Undergraduate Programs Council (UPC), the Associate Dean of Undergraduate Programs, and other HCoB administrators for use in AACSB accreditation. The UPC also uses this information in their curriculum improvement activities. This assessment grant would provide much needed information to help identify areas for BBA improvement and facilitate the accreditation process. Results will be presented to the Center for Research on Instructional Change in Postsecondary Education (CRIEPE) and at the WMU 8th Annual Assessment in Action Conference. A submission will be prepared for the Seventh Annual Conference hosted by the Association for the Assessment of Learning in Higher Education (AALHE) or a similar venue.

5. Describe how the proposed work will enhance your reputation and that of WMU.

This SFSA funding would allow for a substantially larger study with more advanced methodology. Additional data collection in the Spring 2017 FIN3100 sections is expected to increase the number of sections studied from three to six. This would approximately double the number of observations from an estimated 90 students to 180 students included in this study. SFSA funding will substantially improve the statistical power of the analysis. This would promote the current study from a WMU internal assessment into a study with potential for peer-reviewed publication. This would facilitate my development in the business education research area and reinforce WMU's leading role in higher education research. The results of this study may be used to apply for external math education grants related to the pre-requisite quantitative skills for Pre-BBA students.

6. Provide an itemized budget and budget justification. A proposed budget greater than the allowed maximum amount of $2,000 will disqualify the proposal. Such a proposal will not be reviewed. Fully justify why the budgeted expense is necessary for the project.
SFSA Application by Matthew M. Ross  
SFSA Initiation Date: January 1 2017  
SFSA Completion Date: June 30 2017

<table>
<thead>
<tr>
<th>A. OTHER PERSONNEL</th>
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<tbody>
<tr>
<td>Graduate student researcher (40 hours @ $18.00 per hour)</td>
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<td>Subtotal A</td>
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<td>B. PROFESSIONAL DEVELOPMENT</td>
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<td>Travel</td>
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<td>Conference Registration</td>
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<td>C. MATERIALS</td>
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<td>Materials and Supplies</td>
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<td>Presentation display</td>
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<td>Subtotal C</td>
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| D. TOTAL AMOUNT OF THIS REQUEST | 2,000 |

The graduate student researcher requires HSIRB approval and is needed to process the data, including linking ATMI data with prerequisite scores and processing qualitative responses. Talks with the Chair of the Math Department suggest that business math education is an underserved area and an excellent choice for professional development, as such, travel and conference registration to an education assessment conference is requested. Materials and supplies are for printing, copying and related costs. The presentation display is needed to effectively communicate findings of this study.

Faculty member signature: [Signature]

Acknowledgement of Department Chair:
- [ ] The department chair acknowledges submission of the SFSA application.
- [x] The department chair acknowledges the proposed expenses are reasonable and necessary.

Chair’s signature: [Signature]  
Date: 9/20/16

For OVPR use only:
Faculty member completed previous reporting requirements:  
Yes [x] No

Funding decision: Funded [ ] Not funded: [ ]

Date received: SEP 29 2016