Science Program Capstone Project
Job Aid

Introduction
This job aid has been designed to give you an overview of all of the tasks found in the Capstone Written Project assessment, and to help guide you through the submissions process. If you have any questions about the information found in this job aid, please visit the Graduate Capstone Community and contact the Community Facilitator. You may also seek additional guidance from the evaluator once you have begun to submit tasks and an evaluator has been assigned.

You will not be able to access your required tasks in Taskstream until such time as the Capstone Written Project assessment is locked into your term via the AAV call with your mentor. However, in order to allow you to work on the tasks as needed, they are all found in this document. Only once you actually begin to submit your tasks into Taskstream will an evaluator be assigned to grade them. That evaluator will then be responsible for grading all of the tasks you submit for this assessment. That same evaluator will also conduct the Oral Defense of your Capstone Project.

The general guidelines for a Science Program Capstone Written Project are to design, teach, and analyze collected data for a two-week science curriculum unit at the appropriate grade level and for the appropriate science discipline. In other words, you will develop a science curriculum unit; teach it in an elementary, middle, or high school biology, chemistry, physics, or Earth science classroom; collect data using observations or student assessments; and analyze the data using appropriate statistical or qualitative methods to determine how well the curriculum unit performed. All of this should be done in the context of research questions that you are trying to answer in order to solve or better understand a specific problem that you have identified.

Choosing an appropriate area of focus for your Capstone Project is essential. If you are an existing teacher, I recommend choosing an area of focus based on a science topic where your students have typically struggled in the past. You can focus your project on finding ways to improve the success of student learning related to the science topic. If you aren’t an existing teacher it can be difficult to focus your Capstone Project on a specific science topic. In this case, I recommend focusing your Capstone Project on a teaching tool or method that you are interested in instead. Regardless of which route you go, I strongly recommend that you discuss your proposed area of focus and research questions with the Graduate Capstone Community Facilitator before you begin working on any of the required tasks.

The first required task in Taskstream is the Prospectus task. This task requires that you discuss your general area of focus and research setting, define a problem statement and a proposed solution, and define your research question along with describing how you intend to answer such question. Please keep in mind that your proposed solution must include a detailed unit outline describing the teaching strategies that you plan to use, and your description of how you intend to answer your research question must include final versions of any instruments (e.g. student exams) that you plan to use. For a typical Capstone Project, you will use assessments and/or a Likert scale to collect quantitative data and use appropriate statistical tests (e.g. paired or unpaired t-test) to evaluate the effectiveness of your unit and answer your research question.
However, it is also appropriate to use surveys, interviews, observations, and other data to collect qualitative data and use appropriate qualitative data analysis techniques, such as identifying themes and coding. All of this should be adequately discussed in your Prospectus task.

**The Model Capstone Archive**

Western Governors University has developed a Model Capstone Archive to display final capstone written work and presentations. When WGU archives your final capstone documents, these will be made available to current students, mentors, and evaluators after you have graduated. You will be able to determine whether you wish to participate in the Capstone Archive by completing a copy of the Capstone Waiver and Release Form ([https://web5.wgu.edu/aap/content/model%20capstone%20archive%20release%20statement%2004.18.11.pdf](https://web5.wgu.edu/aap/content/model%20capstone%20archive%20release%20statement%2004.18.11.pdf)) at the conclusion of your Capstone Oral Defense Task. By participating, your scholarship and effort at the University will be recognized, and you will have the satisfaction of contributing to the advancement of WGU and its students.

Since your final capstone project is to be shared with the WGU academic community, you will want to make sure that this represents your best work -- rigorous scholarship, research, and pedagogy. WGU has taken great care to ensure that safeguards are in place to guard the academic authenticity and the exposure of sensitive information. When you submit the capstone release statement you agree to voluntarily remove confidential information. This means not only your own personal details and contact information, but also information identifying co-workers, organizations, and their contact information. Here is further information about how your final capstone documents are protected in the Archive ([https://web5.wgu.edu/aap/content/model%20capstone%20security%20and%20anonymity%2004-18-11.pdf](https://web5.wgu.edu/aap/content/model%20capstone%20security%20and%20anonymity%2004-18-11.pdf)).

You will want to go to the Model Capstone Archive ([https://sites.google.com/a/wgu.edu/model-capstones](https://sites.google.com/a/wgu.edu/model-capstones)) to see examples of competent student work in your own program that represents some variety in the way students approach project requirements. Some of the materials housed there are artifacts produced along the way to the final capstone materials so that you can see what is involved during the entire process that you are about to undertake.

**Prospectus Task**

In this task you will briefly outline the problem that you intend to investigate, describe the participants in your study, and state your research questions. You will then describe the data you intend to collect, and the data analysis you propose to conduct once you have gathered the data. This task will need to be approved prior to your moving forward on the remaining tasks found in the Capstone Project assessment.

A. Provide a brief introduction (suggested length of 1 paragraph) that explains the rationale for the proposed project by doing the following:
   1. Present your topic.
   2. Describe the participants in your proposed study, to include demographic information and any additional relevant characteristics of your target population such as cultural factors, learning styles, education levels, prior learning, motivation, etc.

B. Explain the problem and your proposed solution (suggested length of 3 paragraphs) by doing the following:
1. Outline the problem.
2. Describe possible causes of the problem.
3. Describe your proposed solution to the problem.

C. Present your research question(s).

D. Describe how you intend to answer your research questions (suggested length of 3 paragraphs) by doing the following:
   1. Describe the data you will collect.
   2. Describe the instruments and other methods you will use to collect the data.
   3. Describe the data analysis techniques you will use to analyze the data you collect.

Once your Prospectus has been approved, you will need to acquire permission to use human subjects in your project. You will do this by submitting for approval, your proposed “Informed Consent Form,” which outlines that which you propose to do, and which will need to be signed by the participants, or, if they are minors, by their parents or legal guardians. Prior to asking for participant permission, this form must be approved by WGU. You must obtain participants’ permission prior to starting your research.

**IRB Task**

After your Prospectus has been passed, you will address the issue of Human Subjects in Research. This includes completing an Informed Consent Form that explains how your research will deal with issues concerning human subjects.

**Task**

A. You will download and complete the Informed Consent form found here. Then submit it here for review and approval.

   Note: The vast majority of these forms are usually approved, provided they have been filled out completely. However, on occasion, we may require further information from you. In that case, you will be notified, and asked to complete task B, below.

B. Only if the review of the form in task A indicates that further explanation is required, will you be asked to fill out the IRB worksheet, found here. You do not need to download and complete it now.

Once you have obtained your participants’ consent to be in your study, you will then need to submit the first 3 chapters of your Written Capstone Report. These 3 chapters cover the following topics: 1) an introduction to your topic; 2) an explanation of the problem; and 3) a literature review that summarizes the existing research pertaining to your topic. The idea here is to contextualize that which you intend to study. You need to describe the problem, your intended solution, and cite existing research that supports why you believe that your proposed intervention will be successful. You will also want to detail potential difficulties that others have encountered, and describe ways in which you will avoid similar issues. Your submission will be graded not only for content – that is, have you provided an appropriate level of detail so that reviewers understand what it is you are doing, but also, your submission will be graded against the APA format for formal papers. If you have not already purchased the APA Style Manual, you may wish to do so. Else, here are two useful APA format website you may wish to consult:
First 3 Chapters (Introduction, Problem Statement, and Lit. Review) Task

In this task, you will provide an introduction to the problem that you have identified, and that you intend to research during your Capstone Project. You will also state and provide the context for your research questions, via a review of relevant literature.

A. Provide an introduction (suggested length of 4–6 pages) that explains the rationale for the project by doing the following:
   1. Present your topic.
   2. Explain why you chose the topic.
   3. Discuss why the project is important to your discipline.

B. Explain the problem (suggested length of 3–5 pages) by doing the following:
   1. Outline the problem.
   2. Provide background information of the problem.
   3. Discuss possible causes of the problem.

C. Present your research questions.

D. Create a well-organized literature review of 15–20 professional sources by doing the following:
   1. Outline research for best practices for your topic.
   2. Summarize the professional literature relevant to the topic you have chosen.
   3. Provide a conclusion that interprets how the literature applies to the problem being investigated.

E. Provide your preliminary reference list.

F. Include all in-text citations and references in APA format.

Once this task has passed both the content grading and the APA grading, you may proceed to implement your study and gather your data. Once you have finished doing so, you will need to write up what it is that you did, how you did it, and why you did it that way. After that, you will need to summarize your data, analyze it, and present your results. How does the data you collected allow you to answer your research questions? What additional issues or questions does it raise? You will then reflect upon the project, and make recommendations as to what you might do differently if you were to implement it again in the future. You will then also reflect upon your entire degree program, discuss what you’ve learned, and how you’ll use that in your future endeavors.

Last 2 Chapters (Methodology, Data Analysis, Results, and Conclusion) Task

A. Discuss the methodology you used for your project by doing the following:
   1. Discuss the evaluation methods and tools you used.
a. Discuss the reliability and validity of the evaluation methods and tools you used.
2. Discuss how the integrity of data and data use will be maintained.
3. Discuss your research design.
4. Explain your research methods.
   a. Explain why you adopted these research methods.
5. Describe the participants.
6. Describe how you obtained any needed permissions.

B. Present the results of your project by doing the following:
   1. Outline how results will be organized and presented.
   2. Provide a data-driven general statement of the results.
   3. Analyze each set of data.
      a. Create visual aids (e.g., tables, charts, graphics) to display results.

C. Discuss the results of your research project by doing the following:
   1. Provide an overview of the project that restates the general purpose of your research.
   2. Summarize your findings.
      a. Explain how the results of your research were obtained.
   3. Recommend possible solutions to your research problem based on your results.
   4. Discuss implications and limitations of the project by doing the following:
      a. Discuss strengths of the project.
      b. Discuss weaknesses of the project.
      c. Discuss any factors that may have skewed your findings.
   5. Discuss how the study could be improved.
      a. Recommend areas of your topic that could be further investigated.
   6. Critique your master’s degree experience by doing the following:
      a. Reflect on your master’s degree experience.
      b. Reflect on how the experience and skills you have gained can apply in your work environment.

D. Develop a reference list of all the references you cited in your capstone report.

E. Create an appendix for your project that includes the following:
   1. Materials and exhibits important to the project that are referenced in the report.
   2. Data-gathering instruments (e.g., surveys, questionnaires).

F. Include all in-text citations and references in APA format.

Once the above task has been passed you are asked to compile the entire Capstone Written Report into a single document, and to provide an abstract that succinctly describes your project in 150 words or less. You will also include, in the Appendices, all of the materials you used in the completion of your project. This includes any curricular materials you developed, any assessments used, survey or interview protocols, etc. You will then be asked to submit a release form that authorizes WGU to use your project as an example for others to reference and as sample student work for accreditation purposes.

**Final, Complete Written Report Task**

In this task you will create a single document that contains your entire Written Capstone Report, including appendices to contain any curricular materials you designed; any assessments; all
data collection instruments and other materials used.

A. Provide an introduction that explains the rational for the project by doing the following:
   1. Present your topic.
   2. Explain why you chose the topic.
   3. Discuss why the project is important to your discipline.

B. Explain the problem by doing the following:
   1. Outline the problem.
   2. Provide background information of the problem.
   3. Discuss possible causes of the problem.

C. Present your research questions.

D. Create a well-organized literature review of at least 25 scholarly sources by doing the following:
   1. Outline research for best practices for your topic.
   2. Summarize the professional literature relevant to the topic you have chosen.
   3. Provide a conclusion that interprets how the literature applies to the problem being investigated.

E. Discuss the methodology you used for your project by doing the following:
   1. Discuss the evaluation methods and tools you used.
      a. Discuss the reliability and validity of the evaluation methods and tools you used.
   2. Discuss how the integrity of data and data use will be maintained.
   3. Discuss your research design.
   4. Explain your research methods.
      a. Explain why you adopted these research methods.
   5. Describe the participants.
   6. Describe how you obtained any needed permissions.

F. Present the results of your project by doing the following:
   1. Outline how results will be organized and presented.
   2. Provide a data-driven general statement of the results.
   3. Analyze each set of data.
      a. Create visual aids (e.g., tables, charts, graphics) to display results.

G. Discuss the results of your research project by doing the following:
   1. Provide an overview of the project that restates the general purpose of your research.
   2. Summarize your findings.
      a. Explain how the results of your research were obtained.
   3. Recommend possible solutions to your research problem based on your results.
   4. Discuss implications and limitations of the project by doing the following:
      a. Discuss strengths of the project.
      b. Discuss weaknesses of the project.
      c. Discuss problems you noted with your project.
      d. Discuss any factors that may have skewed your findings.
   5. Discuss how the study could be improved.
      a. Recommend areas of your topic that could be further investigated.
   6. Critique your master’s degree experience by doing the following:
      a. Reflect on your master’s degree experience.
b. Reflect on how the experience and skills you have gained can apply in your work environment.

H. Develop a reference list of all the references you cited in your capstone report.

I. Create an appendix for your project that includes the following:
   1. Appendices and exhibits important to the project that are referenced in the report.
   2. Data-gathering instruments (e.g., surveys, questionnaires).

J. Create an abstract (*suggested length 120–150 words*) that is self-contained, concise, and coherent by doing the following:
   1. Discuss the problem that led to your research question.
   2. Describe the participants.
   3. Discuss methodologies for data gathering and analysis.
   4. Summarize the results.
   5. Propose next steps in relation to the problem.

K. Submit the release form.

*Note: Please save word-processing documents as *.rtf (Rich Text Format) files.*

Congratulations! Once this final task has been passed, you will be able to prepare for and then schedule the Oral Defense of your Capstone Project. The Oral Defense will consist of your creation of a slide show presentation that outlines your project. The slide show will provide an overview such topics as: the problem you investigated; your research questions; a brief summary of the literature you reviewed; the participants in your study; your methodology; the data you collected; the results of your data analysis; and your conclusion. You will then present your slide show to an evaluator via teleconference. Further details can be found in the Capstone Oral Defense COS, found under the link that is the code for that assessment in your AAP.

**Feedback**

If you wish to provide feedback on this Course of Study, please contact Rob Duncan at rduncan@wgu.edu