

Program-Level Assessment: Annual Report

Program: Health Data Science

Department: Health and Clinical Outcomes Research

Degree or Certificate Level: MS

College/School: School of Medicine

Date (Month/Year): November 2020

Primary Assessment Contact: Paula Buchanan

In what year was the data upon which this report is based collected? 2019-2020

In what year was the program's assessment plan most recently reviewed/updated? 2019

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle?

Outcome 2: Apply appropriate statistical methods.

Outcome 3: Apply appropriate data management strategies.

Outcome 4: Critically evaluate methodological designs.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please identify the course(s) in which these artifacts were collected. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

Outcome 2

1. We will utilize the final exam from HDS 5310 Analytics and Statistical Programming.
2. We will utilize the final brief report from HDS 5960 Capstone

Outcome 3

1. We will utilize the final project ORES 5160 Data Management.
2. We will utilize the final brief report from HDS 5960 Capstone.

Outcome 4

1. We will utilize the final paper from ORES 5300 Foundations of Outcomes Research I.
2. We will utilize the final brief report from HDS 5960 Capstone.

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and include them in/with this report.

The selected artifacts from a maximum of 10% of the students, 5 students, or all the students in each course will be assessed by 2 faculty members of the department. If there is a disagreement a 3rd faculty member will be brought in to assess the artifact.

We will use the attached rubric to assess the artifacts.

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

The learning outcome of applying the appropriate statistical methods was not well achieved in the Analytics and Stats programming class, however this is the first statistics class they take in our program, showing a range of mastery from low to high. By the time they complete the program they meet the outcome as seen by their capstone proposal which indicted high mastery. Growth was also seen in the "Apply appropriate data management" and "critically evaluates methodological designs" outcomes. In the introductory classes the average scores were close to high

mastery, but by the capstone everyone was at high mastery on these two outcomes. All the courses included in this assessment are taught in person on the STL campus. In addition, the courses are all required for the program.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you?

The results have highlighted that our HDS 5310 Analytics and Statistical Programming course needs to be reworked. Furthermore, we noticed that students were missing some basic foundational skills vital when it came to Outcome 2- applying appropriate statistical methodology. We found that students were not able to state the “why” when working through their methodology section. It was found that the lower scores for the other outcomes were mainly due to this same reason. The students were unable or did not explain the “why”.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss these results and findings from this cycle of assessment?

We shared these findings during our faculty meeting and have scheduled numerous meetings during both fall and spring semesters to constantly revisit our programmatic goals as well as review each course closely. We have also changed instructor for the first foundational course that the students take, the HDS 5310 Analytics and Statistical Programming course.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you’ve initiated one or more of the following:

Changes to the Curriculum or Pedagogies

- Course content
- Teaching techniques
- Improvements in technology
- Prerequisites

- Course sequence
- New courses
- Deletion of courses
- Changes in frequency or scheduling of course offerings

Changes to the Assessment Plan

- Student learning outcomes
- Artifacts of student learning
- Evaluation process

- Evaluation tools (e.g., rubrics)
- Data collection methods
- Frequency of data collection

Please describe the actions you are taking as a result of these findings.

We have changed the instructor for HDS 5310 course. We also reviewed the course objectives closely to ensure the assignment is reflective of the course and program goals. Furthermore, we are going to make changes to the course content to ensure additional skills vital for success in the field will be covered. We also realized we need to change the artifact collected for the assessment review. We want to ensure the artifacts selected will be reflective of what is being assessed.

If no changes are being made, please explain why.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years as a result of assessment data?

We have updated assignments and reviewed course content because of assessment data.

B. How has this change/have these changes been assessed?

These changes have not been assessed as it was the first cycle of assessment for SLOs 1,5 and 6 . We are reassessing these SLOs in the next cycle.

C. What were the findings of the assessment?

N/A

D. How do you plan to (continue to) use this information moving forward?

We look forward to our next assessment cycle so that we can evaluate the changes made to our program.

IMPORTANT: Please submit any assessment tools and/or revised/updated assessment plans along with this report.

MS in Health Data Science Program Assessment Rubric

#	MS in Health Data Science Program Learning Outcomes	High Mastery (2)	Average Mastery (1)	Low Mastery (0)
1	Identify and define an analytic/operational question.	<ul style="list-style-type: none"> • Clearly identifies high value question • Question identifies a gap in the current literature/knowledge base • Background and contextual information flow seamlessly into a well stated analytic/operational question that has potential to add to the professional knowledge base • Identifies dataset that can answer the question 	<ul style="list-style-type: none"> • Identifies question correctly but more could have been done with background information and dataset. 	<ul style="list-style-type: none"> • Question lacks clarity and is not answerable • Dataset does not answer the question
2	Apply appropriate statistical methods.	<ul style="list-style-type: none"> • Utilize appropriate statistical methods to analyze data in the chosen content area • Clearly describes the types of variables used • Clearly describes the outcomes of the data analysis • Display the data analysis visually using a graph, table, etc. • Factors that may have contributed to the data 	<ul style="list-style-type: none"> • Most statistical methods were correctly applied but more could have been done with the data. 	<ul style="list-style-type: none"> • Some statistical methods were applied but with significant errors or omissions.

		<p>obtained</p> <ul style="list-style-type: none"> • Implications of the data analyzed 		
3	Apply appropriate data management strategies.	<ul style="list-style-type: none"> • Utilizes appropriate data management strategies to analyze data in the chosen content area • Clearly describes steps utilized to extract data • Clearly describes steps utilized to clean data 	<ul style="list-style-type: none"> • Most data management strategies to analyze data in the chosen content area were correctly applied but more could have been done with the data. 	<ul style="list-style-type: none"> • Does not utilize appropriate data management strategies to analyze data in the chosen content area • Does not describe steps utilized to extract data • Does not describe steps utilized to clean data
4	Critically evaluate methodological designs.	<ul style="list-style-type: none"> • Original, clear, creative, and innovative • Provides thorough and comprehensive description • Flows from question and theory • Uses state-of-the-art tools, techniques, or approaches • Applies or develops new methods, approaches, techniques tools, devices, or instruments • Uses multiple methods • Analysis is sophisticated, robust, and precise • Uses advanced, powerful, cutting-edge techniques 	<ul style="list-style-type: none"> • Appropriate for the problem • Uses existing methods, techniques, or approaches in correct and creative ways • Discusses why method was chosen • Analysis is objective, thorough, appropriate, and correct • Uses standard methods 	<ul style="list-style-type: none"> • Lacks a method • Uses wrong (statistical) method for the problem • Uses (statistical) method incorrectly • Methods do not relate to question or theory • Is fatally flawed or has major confound • Does not describe or describes poorly (insufficient detail) • Is minimally documented Shows basic competence • Analysis is wrong, inappropriate, or incompetent
5	Understand the organization and financing of healthcare, and resulting datasets	<ul style="list-style-type: none"> • Utilizes datasets correctly • Utilizes codes appropriately 	<ul style="list-style-type: none"> • Utilizes datasets minimally 	<ul style="list-style-type: none"> • Does not utilize appropriate dataset

		<ul style="list-style-type: none"> • Provides necessary historical and background information on your issue • Includes data that are most important for your audience • Presents different sides of controversial issues, if any • States current state of law or policy • Includes data or information that is necessary to the reader's understanding • Presents necessary data in best format (text, bar graph, line graphs, etc.) • States the policy recommendation that you support • Provides information in favor of the policy option you support • Anticipates and rebuts arguments against likely to be raised against your recommended policy option 	<ul style="list-style-type: none"> • Utilizes codes minimally • Provides minimal background information • Presents one side of the argument • Provides minimum information of policy option 	<ul style="list-style-type: none"> • Does not utilize correct codes • Does not provides background information • Does not provide information of policy option
6	Effectively communicate results of analysis.	<ul style="list-style-type: none"> • Results are aligned with question and theory • Sees complex patterns in the data • Iteratively explores questions raised by analyses • Results are usable, meaningful, and 	<ul style="list-style-type: none"> • Links results to question and theory • Substantiates the results • Provides plausible arguments and explanations 	<ul style="list-style-type: none"> • Results are correct but not robust • Includes extraneous information and material • Has difficulty making sense of data • Interpretation is too simplistic

		<p>unambiguous</p> <ul style="list-style-type: none">• Presents data clearly and cleverly• Makes proper inferences• Provides plausible interpretations• Refutes or disproves prior theories or finding		<ul style="list-style-type: none">• Data are wrong, insufficient, fudged, fabricated, or falsified• Data or evidence do not support the theory or argument• Interpretation is too simplistic, and not objective, cogent, or inferences• Overstates the results
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