

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): September 2021

Primary Assessment Contact: Paula Buchanan

In what year was the data upon which this report is based collected? 2020-2021

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 1: Identify and define an analytic/operational question.

Outcome 5: Understand organization and financing of healthcare, and resulting data sets.

Outcome 6: Effectively communicate results of analyses.

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 1

1. We will utilize the final exam from HDS 5330 Predictive Modeling and Machine Learning.
2. We will utilize the final brief report from HDS 5960 Capstone

Outcome 5

1. We will utilize the final report and education video from ORES 5210 Foundations of Medical Diagnosis and Treatment.
2. We will utilize the final brief report from HDS 5960 Capstone

Outcome 6

1. We will utilize the final project ORES 5160 Data Management.
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)?

Outcome 1: Score 1.8/2. For the most part students were able to identify and define an analytic and operational question. Only 2 students scored as average mastery while the rest of the scored assignments received high mastery. These scores were given on the independent learning of the capstone experience.

Outcome 5: Score 1.8/2. This was based off of one online and one independent studies course (capstone experience). It appeared that the students did slightly better in the online course.

Outcome 6: Score 1.8/2. Like outcome 1 only 2 students scored as average mastery while the rest of the scored assignments received high mastery. These were given on the capstone experience only. The in-person class had high mastery scores on all artifacts.

Overall course modality did not appear to make a difference. Of the courses assessed only 1 was online and the rest were face-to-face or independent work (capstone experience). Looking at the lower scoring assignments on all outcomes they were from capstone projects where the students completed their last courses and capstone remotely due to COVID, where they had less direct interaction with their mentors due to working remotely. They appeared rushed and lacked many of the expected details.

5. Findings: Interpretations & Conclusions

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

We have learned that students working remotely should have frequent and set meetings with their capstone preceptor. Students should also be required to submit a draft of their final capstone presentation at least a month before the final due date. Mentors should also be held more accountable in what the student presents as a final project. The results tell us that we need to do better in laying out our expectations of the preceptors and mentors of the capstone projects and of the projects themselves.

These scores are slightly lower for the capstone experience than they were on the last assessment. It is believed that learning and working remotely had a small effect on learning. We are looking forward to seeing if the next assessment of these outcomes produces increased scores again.

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 August faculty meeting. Furthermore, we have scheduled a faculty retreat in November to go over our curriculum and course content and reassess the artifacts utilized for the assessment. We plan to use this retreat day to also evaluate the teaching techniques of course content.

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.

The results of this finding have led us to revisit some of the course content within our courses. Although our students have exceeded the program criteria, we do believe we need to focus on areas of growth for our students and program. We hope the retreat day we have planned in August will help us assess course content closer as well as teaching techniques currently in place and factors influencing growth and success among our students within the program. We also hope to make our course content more inclusive.

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?

One change we made was replacing the HMP 5000 Healthcare Organization course with the HDS 5960 Capstone Experience for our SLO#5. A reason for this is that HMP is a course offered by the College for Public Health and Social Justice and we were not able to change the course content for this course. While we do feel this course is beneficial for our students and programmatic goals, we found that utilizing HDS 5960 Capstone Experience artifacts was vital in assessing the SLO. We found this change to be informative to assess the SLO#5 and we plan to utilize the artifacts from HDS 5960 capstone experience moving forward.

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

As noted in our 2019 assessment report, we stated that we needed to update our course artifacts for some of our courses. We did make the appropriate changes. We are assessing the change in this year's report. In addition, we found that our standing faculty meeting each semester was beneficial in discussing programmatic challenges and growth.

C. What were the findings of the assessment?

Our findings indicate that while we are achieving high ratings based on our rubric, this is not sufficient to stop the continuous assessment process. We find that this assessment gives us an insight into what works and what does not for our program. As stated above, we found our artifacts to not align well with the SLOs. We implemented the change for this cycle and noted that the replacement artifacts were better fit to assess the SLOs. The annual assessment reviews have been a wealthy source of information and insight into how our students are growing and if program SLO's are being met.

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

We have found this process to be vital in identifying strengths and weaknesses of our program. We want to ensure students are meeting our curricular goals and can apply skills and knowledge gained from this program in their respective field of work. We have also found that having a program assessment retreat each semester helpful to navigate the good, bad and the ugly of our program. We plan to continuously review our courses closely. We will review assignments, exams and how they fit with the course objectives and programmatic outcomes. In addition, we also want to ensure the artifacts gathered for the programmatic reviews are helpful and beneficial to the annual assessment cycle.

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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