SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program: Health Data Science (HDS)	Department: Health and Clinical Outcomes Research
Degree or Certificate Level: MS	College/School: School of Medicine
Date (Month/Year): December 2022	Primary Assessment Contact: Dr. Paula Buchanan and Dr. Divya Subramaniam

In what year was the data upon which this report is based collected? 2021-2022

In what year was the program's assessment plan most recently reviewed/updated? March 2022

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: Apply appropriate statistical methods.

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

Outcome 3: Apply appropriate data management strategies.

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

Outcome 4: Critically evaluate methodological designs.

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

Note: Our ORES courses are completely online. Whereas our HDS courses are offered both online and in-person.

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 2: Score 2/2 in the introduction, development, and reinforced classes. Score 2/2 on the achieved course. All courses assessed were taught on the ground at the STL campus and one independent studies capstone course. Students were able to identify and define an analytic and operational question. All students assessed at each level of student development received full scores indicating they have fully demonstrated they met the objective.

Outcome 3: Score 1.8/2 in the introduction, development, and reinforced classes. Score 2/2 on the achieved course. This was based on one face-to-face course and one independent studies course (capstone experience). While not all students mastered this outcome in the first course, they have shown proficiency in the capstone where they achieved it.

Outcome 4: Score 1.4/2. in the introduction, development, and reinforced classes. Score 2/2 on the achieved course. Only 3 students scored as average mastery while the rest of the scored assignments received high mastery. These were given on the foundations course only (an online asynchronous course), where the objective was introduced and developed. By the time the students completed their capstones they showed they have achieved 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 courses where the material was introduced and developed. By the time the students reached the Capstone level they showed they had high mastery of all outcomes.

5. Findings: Interpretations & Conclusions

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

We can see from the assessments that students are being taught the material needed to meet our program student learning objectives. They only obtain average mastery after courses that introduce and develop the material. This is to be expected as we anticipate that they will further develop the skills in the subsequent courses in the program. We have learned that by the time the students complete their capstone projects they have achieved high mastery of the objectives of the program. We hope that as students progress through the degree program, they continue to develop their skills and abilities while meeting program SLOs set in place. Furthermore, we plan to continually utilize the assessment findings to improve our curricular goals.

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 will share these findings during our January faculty meeting. We had a meeting in early December 2022 to discuss initial results and discussed course sequence and 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 findings from these assessment processes have led us to reconsider some of the artifacts utilized to measure SLOs. For example, for HDS 5310 Analytics and Stats Programming, we have decided that we will not utilize the final multiple-choice exam for the assessment. Instead, we will utilize the final report as it is a better gauge for programmatic and pedagogy growth.

Additionally, for the next assessment plan revision, we hope to utilize four courses and corresponding artifacts (instead of two courses from current plan) to capture the distinct stages of learning (introduced, developed, reinforced, and achieved) to show growth in student learning outcomes as well as improving our overall curricular pedagogy.

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?

In March 2022, we hosted a faculty retreat to reevaluate our MS in HDS program. From there we determined the made changes to our assessment plan. We decided on increasing the number of artifacts to ensure each category of introduced, developed, reinforced, and achieved were evaluated. Further, the rubric was reevaluated to ensure its alignment with our SLOs. Next, we developed a program skills map for the MS in HDS program (see attached).

Another change we made was replacing the HMP 5000 Healthcare Organization course with our own version of HDS 5130 Healthcare Organization, Management, and Policy course.

Lastly, we adjusted our program curriculum map to ensure the course sequencing was suitable for learning growth among our students. Furthermore, we developed a programmatic skills map for our students to show how our courses correspond to student learning outcomes and skills and abilities required for successful program completion. We wanted to ensure these steps would enhance our program pedagogy and curriculum for student learning success.

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

We are assessing the change in this year's report and next year with the other SLOs. We will compare the results with this and next year's assessments with the previous 2 assessments on the same outcomes to determine if the changes to the program sequence of courses and artifacts used for assessment improved student learning outcomes.

C. What were the findings of the assessment?

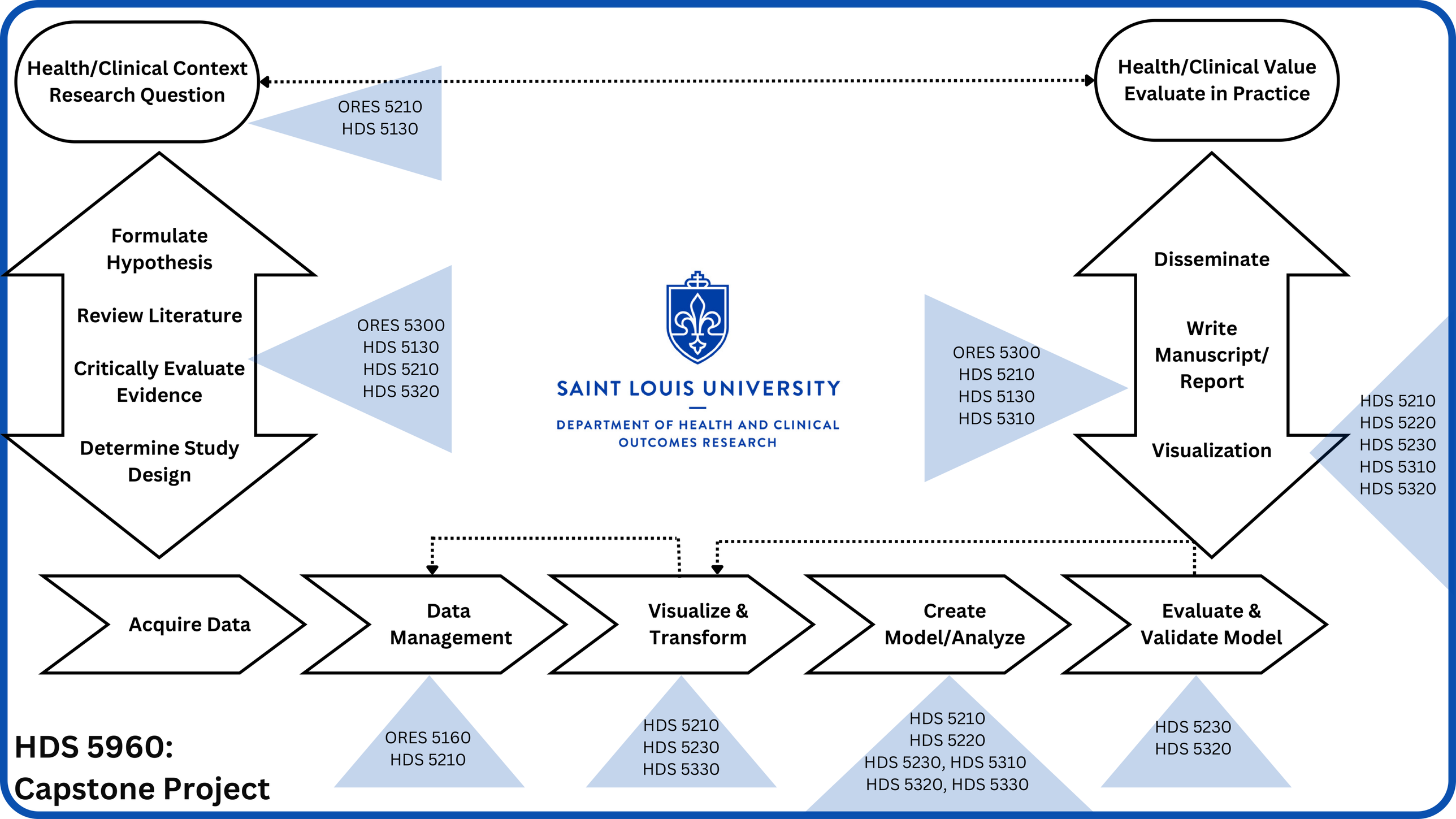
We are assessing the change in this year's report and next year with the other outcomes.

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

We plan to be intentional by ensuring that standing meetings are in place to discuss programmatic assessment and growth. Additionally, we seek to use the feedback received from assessment reviews to be better prepared and ready for overall programmatic review. We also have a plan in place to be on top gathering artifacts as soon as courses are finished so that instructors can provide them to us in a timely manner.

We plan to further review course materials being taught as a faculty group to ensure SLOs are achieved through our courses and program.

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



HDS 5960: Capstone Project

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.	• 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	• Identifies question correctly but more could have been done with background information and dataset.	• Question lacks clarity and is not answerable • Dataset does not answer the question
2	Apply appropriate statistical methods.	• 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	• Most statistical methods were correctly applied but more could have been done with the data.	• Some statistical methods were applied but with significant errors or omissions.

		obtained • Implications of the data analyzed		
3	Apply appropriate data management strategies.	• 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	• Most data management strategies to analyze data in the chosen content area were correctly applied but more could have been done with the data.	• Does no 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.	• 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	• 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	• 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	• Utilizes datasets correctly • Utilizes codes appropriately	• Utilizes datasets minimally	• Does not utilize appropriate dataset

		• 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	• Utilizes codes minimally • Provides minimal background information • Presents one side of the argument • Provides minimum information of policy option	• Does not utilize correct codes • Does not provides background information • Does not provide information of policy option
6	Effectively communicate results of analysis.	• Results are aligned with question and theory • Sees complex patterns in the data • Iteratively explores questions raised by analyses • Results are usable, meaningful, and	• Links results to question and theory • Substantiates the results • Provides plausible arguments and explanations	• Results are correct but not robust • Includes extraneous information and material • Has difficulty making sense of data • Interpretation is too simplistic

		unambiguous • Presents data clearly and cleverly • Makes proper inferences • Provides plausible interpretations • Refutes or disproves prior theories or finding		• 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