

Annual Assessment Report

Department: Kinesiology
Academic Year: 2020-2021
Date of Submission: October 9, 2020
Department Chair: Gregg Afman

I. Response to the previous year PRC’s recommendations

| | |
|---------------|------------------|
| Item: | Response: |
| Item: | Response |
| Item: | Response: |
| Item: | Response: |
| Notes: | |

II A. Program Learning Outcome (PLO) assessment

If your department participated in the ILO assessment you may use this section to report on your student learning in relation to the assessed ILO. The assessment data can be requested from the Dean of Curriculum and Educational Effectiveness.

| | |
|---|---|
| Program Learning Outcome | Scholarly writing – Students will be able to read, interpret, understand, and apply knowledge of scholarly writing through a planned, systematic progression in the Kinesiology major, beginning in Foundations (KNS 072) and culminating in Senior Capstone (KNS 195). |
| Who is in Charge /Involved? | Tim VanHaitsma Ogechi Nwaokalemeh |
| <u>Direct Assessment Methods</u> | Every student in KNS 072 - Foundations and KNS 105 – Physiology of Exercise read a research paper titled, “Chocolate Milk as a Post-Exercise Recovery Aid”. While reading, each student answered an 11-question survey. The Foundations class took the survey during the first half of the semester, the Physiology of Exercise class took the survey as part of their final exam. The survey for both classes were evaluated using a rubric. The same reader read all surveys. The data was recorded and statistically analyzed. |

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| <u>Indirect Assessment Methods</u> | None. |
| Major Findings | Students in kinesiology progressed in their ability to read, interpret, and understand literature from Foundations to Exercise Physiology. |
| Closing the Loop Activities | The main area where students struggled was understanding the overall takeaway from the study (Q4 – Discussion). Many of the answers for this question were fairly simplistic, suggesting that they did not take time to deeply understand the implications of the study. Many of the students simply answered that “This study suggests that chocolate milk is a good beverage for recovery” rather than thinking through the methodology (4-hour recovery between bouts of exercise) or that chocolate milk performed the same as Gatorade (one beverage has protein, the other is only carbohydrates). Neither of these thoughts really raised red flags in students’ minds. This suggests that we, as the kinesiology department, need to have students read more academic papers where the main goal is to draw a conclusion and apply the findings of the paper in a simple take-home message that still shows an understanding of the methods and the results. These results will be discussed at a department meeting in the fall and we will find ways to improve our students’ ability to form a more nuanced ability to apply the findings from a study. |
| Collaboration and Communication | |

or/and

II B. Key Questions

| | |
|---|--|
| Key Question | |
| Who is in Charge/Involved? | |
| <u>Direct Assessment Methods</u> | |
| <u>Indirect Assessment Methods</u> | |

| | |
|--|--|
| Major Findings | |
| Recommendations | |
| Collaboration and Communication | |

III. Follow-ups

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|--|--|
| Program Learning Outcome or Key Question | |
| Who was involved in implementation? | |
| What was decided or addressed? | |
| How were the recommendations implemented? | |
| Collaboration and Communication | |

IV. Other assessment or Key Questions related projects

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|--|--|
| Project | |
| Who is in Charge /Involved? | |
| Major Findings | |
| Action | |
| Collaboration and Communication | |
| | |

V. Adjustments to the Multi-year Assessment Plan (optional)

| Proposed adjustment | Rationale | Timing |
|----------------------------|------------------|---------------|
| | | |
| | | |

VI. Appendices

- A. Annual Assessment PLO 2019-2020
- B. Chocolate Milk Questions
- C. Chocolate Milk Rubric-3

APPENDIX A

Annual Assessment PLO 2019-2020

PLO – Scholarly writing – Students will be able to read, interpret, understand, and apply knowledge of scholarly writing through a planned, systematic progression in the Kinesiology major, beginning in foundations and culminating in Senior Capstone.

Methods

An 11-question open response assignment was given to KNS072 – Foundations and KNS105 – Exercise Physiology which asked specific questions about a research paper. The research paper was titled, “Chocolate Milk as a Post-Exercise Recovery Aid”. Foundations is a class taken by primarily freshman and sophomore kinesiology students and the survey was given in the first half of the class as a take-home assignment. In all, 26 students took the survey, though 2 were excluded because they were upper classman and had already taken exercise physiology. Exercise physiology is a class taken primarily by juniors and seniors, and the survey was given as part of the final exam using Canvas. In all, 26 students took the survey and all were included in the analysis.

The responses to all of the surveys were examined by the same grader within two weeks using a rubric. Each question was graded on a 0-5 rank with 0 = no understanding and 5 = Excellent understanding. Equal variance t-tests were performed for each of the 11 questions. Questions were also grouped into four sections (Introduction, methods, results, and discussion) and each section was also compared using an equal variance t-test. All values are reported as Mean \pm SD and the results for Foundations are always reported first.

Results

The first two questions of the survey examined the Introduction of the paper. Overall, there was no difference between Foundations and Exercise Physiology in understanding the basic rationale (3.7 ± 1.25 vs 4.23 ± 1.14 , $p = .11$), but there was a difference in understanding the hypothesis based on the question of “What did the researchers’ expect to find from the study” (2.9 ± 1.8 vs 4.5 ± 1.24 , $p < .001$).

The next three questions examined how well students were able to interpret the methods. There was a significant difference in understanding of the general study design (2.4 ± 1.3 vs 4 ± 1.0 , $p < 0.001$) and determining the primary outcome measure of the study based on reading the methods (2.1 ± 1.9 vs 4.6 ± 1.3 , $p < 0.001$). However, there was no difference in interpreting the primary differences between the three beverages used in the study, potentially due to not clarifying that this was a methodology question, rather than a results question in the Exercise Physiology class. This question was listed in the methods section for the Foundations class.

Only one question was asked based on the results of the study. Students in exercise physiology were significantly better at understanding the significant findings of the study (3.3 ± 1.6 vs $4.7 \pm .92$, $p < 0.001$).

Finally, four questions were asked from the discussion section. The first study examined how well students were able to differentiate from this study and previous studies. Students in exercise physiology were able to better understand and pick up on more of the differences. Typically, students in foundations found one of the differences, whereas students in exercise physiology often picked up on 2-3 of the differences (2.1 ± 1.6 vs 3.6 ± 1.5 , $p < 0.001$). There was also a significant difference in how well foundations students were able to understand the differences between each of the beverages may have affected performance (2.8 ± 1.8 vs 4.5 ± 0.9 , $p < 0.001$). There was no difference in understanding why previous diet mattered for exercise testing between classes as both classes were able to understand this concept (4.2 ± 1.4 vs 4.8 ± 0.9 , $p = 0.10$). Finally, students in exercise physiology were better able to interpret the overall meaning of the study, having a more nuanced interpretation of what this study actually means (3.2 ± 1.3 vs 4.2 ± 1.3 , $p < 0.01$).

Table 1 – Summary of scores for each question

| | Foundations | Exercise Physiology | P-value |
|----------------------|-----------------|---------------------|---------|
| Introduction – Total | 6.6 ± 2.5 | 8.7 ± 2.0 | .001 |
| Q1 | 3.7 ± 1.3 | 4.2 ± 1.1 | .11 |
| Q2 | 2.9 ± 1.8 | 4.5 ± 1.2 | .0004 |
| Methods – Total | 7.2 ± 5.1 | 11.8 ± 2.6 | <0.0001 |
| Q1 | 2.4 ± 1.3 | 4.0 ± 1.0 | <0.0001 |
| Q2 | 2.1 ± 1.9 | 4.6 ± 1.3 | <0.0001 |
| Q3 | 2.7 ± 2.0 | 3.2 ± 2.0 | .33 |
| Results – Total | 3.3 ± 1.6 | 4.7 ± 0.9 | .0004 |
| Discussion – Total | 12.3 ± 4.7 | 17.1 ± 3.3 | .0001 |
| Q1 | 2.1 ± 1.6 | 3.6 ± 1.5 | .0007 |
| Q2 | 2.8 ± 1.8 | 4.5 ± 0.9 | .0001 |
| Q3 | 4.2 ± 1.3 | 4.8 ± 0.9 | .10 |
| Q4 | 3.2 ± 1.3 | 4.2 ± 1.3 | .007 |
| Total | 43.2 ± 14.1 | 62.8 ± 8.9 | <0.0001 |

Discussion

Overall, students in kinesiology progressed in their ability to read, interpret, and understand literature from foundations to exercise physiology. Even when there was not a significant difference between the classes, there was a trend towards improvement by the time students finish exercise physiology. In addition, following exercise physiology, students scored above an average of 4 on all but two questions. The first question in which they did poorly, Q3 of methods, could be due to the manner in which the survey was administered. The foundations class was given the questions separated by section of the paper, whereas the exercise physiology questions were not separated by paper section, so many students confused the question as a results question. The other question with which students struggled was Q1 of the discussion. Many students were able to correctly answer the question with one of the possible

differences though the paper listed three different possibilities. To get full credit, students had to give all three responses which very few students actually did.

Closing the loop

The other area where students struggled was understanding the overall takeaway from the study (Q4 – Discussion). Many of their answers for this question were fairly simplistic, suggesting that they did not take time to deeply understand the implications of the study. Many of the students simply answered that “This study suggests that chocolate milk is a good beverage for recovery” rather than thinking through the methodology (4-hour recovery between bouts of exercise) or that chocolate milk performed the same as Gatorade (one beverage has protein, the other is only carbohydrates). Neither of these thoughts really raised red flags in students’ minds. This suggests that we, as the kinesiology department, need to have students read more academic papers where the main goal is to draw a conclusion and apply the findings of the paper in a simple take-home message that still shows an understanding of the methods and the results. These results will be discussed at a department meeting in the fall and we will find ways to improve our student’s ability to form a more nuanced ability to apply the findings from a study.

APPENDIX B

Chocolate Milk Questions

Chocolate milk as a post-exercise recovery aid

Please read "Chocolate Milk as a Post-Recovery Aid" by Jason Karp. While answering the questions related to this article, you are welcome to have the paper next to you.

Introduction

- What is the basic rationale for why the researchers wanted to do this study?
- What did the researcher's expect to find from the study?

Methods

- What was the general study design?
- What do you think was the primary outcome measure based on the methods?
- What were the primary differences between the beverages?

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Results

- What were the significant findings from this study?

Discussion

- Why did the authors suggest that their findings differed from a previous study where CR performed better than FR?
- Why did the authors think there may be differences between the three beverages in terms of exercise performance, especially in terms of CR?
- Why was it important that diet was the same for the three days prior to testing for each session?
- What is your overall takeaway from this study?

APPENDIX C
Chocolate Milk Rubric-3

| Name | | Class Rank | | |
|---|--|--|--|---|
| Introduction | 5 - Excellent | 3 - Good to Fair | 1 - Unsatisfactory | 0 - None |
| 1. Rationale study | Strong understanding of underlying rationale for the study | Decent understanding of underlying rationale | Little understanding of the rationale | No understanding of the underlying rationale |
| 2. Hypothesis/Expectations | Correctly found and interpreted the hypothesis | Mostly identified the hypothesis | Partly identified the hypothesis | No understanding of the hypothesis |
| | | | | Total: |
| Methods | 5 - Excellent | 3 - Good to Fair | 1 - Unsatisfactory | 0 - None |
| 1. General Study design | Correctly identified as randomized, crossover design | Missing one of the factors | Missing both factors | No understanding of study design |
| 2. Primary Outcome Measure | Identified Endurance Performance trial - TTE | Only said Endurance Time | Chose Lactate Measurement | Did not choose a method |
| 3. Differences between beverages | Identified CHO, PRO, Fat, Energy, and electrolytes as different | Only identified Energy components, no electrolytes | Only saw differences in one of the components | Did not find where the differences were |
| | | | | Total: |
| Results | 5 - Excellent | 3 - Good to Fair | 1 - Unsatisfactory | 0 - None |
| 1. Significant Findings? | TTE and Total work were higher in chocolate milk and FR than CHO replacement drink, no other differences | Only said Milk performed best, TTE | Did not identify the significant differences | Completely lost |
| | | | | Total: |
| Discussion | 5 - Excellent | 3 - Good to Fair | 1 - Unsatisfactory | 0 - None |
| 1. Differ from previous study where CR better than FR | Identified Dif. Amounts of actual CHO, differing designs, and differing intensities | Identified 2 of the reasons | Identified 1 of the reasons | Identified 0 reasons |
| 2. Difference in exercise performance, esp. with CR | Identified that CR has complex carbs, no sucrose, potentially delaying liver glycogen resynthesis. Muscle glycogen resynthesis may be faster with more simple carbs. | Only identified that CR has complex carbs, no mention of sucrose or that muscle glycogen resynthesis is faster with simple carbs | Identified a difference, but did not attribute to complex carbs or simple carb difference. | No reason identified. |
| 3. Diet same for 3 days, why? | Made a hypothesis on why the same diet was used for 3 days. Related it to pre-exercise carbohydrate and muscle glycogen stores | No reference to stored carbs | No reference to macronutrient composition. | |
| 4. Overall takeaway? | Has a nuanced explanation as to why this study may/or may not/ mean that chocolate milk is actually the best option for recovery. | Has a simple explanation of chocolate milk vs gatorade. | Takeaway does not relate to study or incorrectly interprets the study. | Takeaway is completely wrong and does not apply |
| | | | | Total: |
| | | | | Overall Score: |