

Report : Assessment Cycle Details for : Chemistry/BioChemistry

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Workspace : Academic Program Assessment and Planning Workspace

Assessment Plan : 2017-2018 Assessment Cycle: Assessment Plan and Assessment Findings

Assessment Plan Template : IU Kokomo Academic Assessment Template

Report Generated : Thursday, May 31, 2018

Measures and Findings

General Education 9. Physical and Life Sciences

Outcome

Outcome 1: Students will apply the methods natural scientists use to explore natural phenomena

Components:

1. Students will analyze, process and/or interpret data.
2. Students will evaluate the significance of the interpreted data.

Mapped to:

No Mapping

Measure

Spring 2017 Chemistry C101 – Elementary Chemistry General Education Assessment

INSTITUTION LEVEL; DIRECT - EXAM

Details/Description :

How student learning was measured:

Component 1. Students will analyze, process, and/or interpret data.

-Final Exam, question 21 a): recognizing whether a chemical reaction is endothermic or exothermic.

Component 2. Students will evaluate the significance of the interpreted data.

-Final Exam, question 21 b) & question 6: understanding how a change in equilibrium conditions will affect the position of an equilibrium reaction.

Acceptable Target :

80%

Implementation Plan (timeline) :

Key/Responsible Personnel :

Denise Chauret

Supporting Attachments :

Findings

for Spring 2017 Chemistry C101 – Elementary Chemistry General Education Assessment

Summary of Findings :

Quantitative findings:

Component 1: 83% of the students correctly identified the reaction as endothermic or exothermic.

Component 2: The Final Exam question regarding the effect of changes on an

equilibrium was answered 61% correctly.
(Answering the question at least 70% correct: 61% of the students)

Acceptable Target Achievement:

Not Met

Reflections/Notes :

There were 18 students who took the final exam.
These students ranged from freshman to senior.

Consider assigning completion points to voluntary homework questions, to provide more incentive for students to gain extra experience working with concepts.

Substantiating Evidence :

Goal II: Laboratory Work and Performance

❖ Outcome

Outcome 2.2

Students will collect, analyze and draw relevant conclusions from experimental data.

Components:

- 1. Collection and organization of relevant data.*
- 2. Analyze experimental data appropriately.*
- 3. Interpretation of processed data.*
- 4. Identification of experimental errors.*

Mapped to:

No Mapping

Measure

C311 Instrumentation Lab Assessment

PROGRAM LEVEL; DIRECT - STUDENT ARTIFACT

Details/Description :

1. Collection of experimental data:

Method: All experiments during the semester involved the running the instrumentation, understanding the software associated with each instrument, following procedures for preparation of analytical set of reagents, and solutions, collecting data from spectroscopic equipment, electrochemical devices, and Gas, and liquid chromatographs. and writing the technical reports. The quality of the report (including the discussion of the results) were the criteria for measuring the student learning.

2. Interpretation of experimental data

Method: In the lab report for Pulsed techniques, students analyzed the selectivity and sensitivity of each technique they used such as normal pulse voltammetry (NPV), differential pulse (DPV), square wave, and stripping square wave (OSQWV). Students were asked to demonstrate 1) Mastering the use of the equipment and changes parameters and generate results under different conditions and parameters, 2) analyze the generated data, discuss any possible source/s of errors and 3) write a lab report.

Acceptable Target :

80% success

Implementation Plan (timeline):

Key/Responsible Personnel:

Kasem Kasem

Supporting Attachments:

Findings

for C311 Instrumentation Lab Assessment

Summary of Findings :

1. Collection of experimental data

Results:

Biochemistry/Chemistry majors: 100% (5/5 students)

2. Interpretation of experimental data

Results:

Biochemistry/Chemistry majors: 100% (5/5 students)

Acceptable Target Achievement:

Met

Reflections/Notes :

100% of Biochemistry and chemistry majors achieved the goals. In the future, is to collect more data in goal (II), outcome (II), considering the low number of chemistry/ biochemistry majors involved in this assessment on spring 2017. Combining two years data may give better and accurate insight on assessment process.

Substantiating Evidence :

Action

in 2016 -2017 Academic year Data or 2016 Calendar year data - Action Plan

C311 Actions

No Status Added to C311 Actions

Action details:

100% of Biochemistry and chemistry majors achieved the goals. In the future, is to collect more data in goal (II), outcome (II), considering the low number of chemistry/ biochemistry majors involved in this assessment on spring 2017. Combining two years data may give better and accurate insight on assessment process.

Implementation Plan

(timeline):

Key/Responsible

Personnel:

Kasem Kasem

Measures:
Subsequent assessment

Supporting Attachments:

Measure

Collection of experimental data C329

PROGRAM LEVEL; DIRECT - EXAM

Details/Description :

During lab practical, students measured the absorbance of unknown proteins mixed with Bradford dye using spectrophotometer. Students had to demonstrate 1) how to use a spectrophotometer, 2) how to use a pipet man correctly to transfer an adequate amount of solution, 3) obtained the values for unknown proteins, and 4) calculate the protein concentration in the unknown sample.

Acceptable Target :

80%

Implementation Plan (timeline):

Key/Responsible Personnel:

Hisako Masuda

Supporting Attachments:

Findings

for Collection of experimental data C329

Summary of Findings :

Biochemistry/Chemistry majors: 100% (3/3 students)

Biology/BIPH/Psychology majors: 80% (7/9 students)

Acceptable Target Achievement:

Met

Reflections/Notes :

Substantiating Evidence:

Action

in 2016 -2017 Academic year Data or 2016 Calendar year data - Action Plan

C329 Actions

No Status Added to C329 Actions

Action details:

100% of Biochemistry and chemistry majors achieved the goals. In the future, instructions to increase the efficacy of the protein purification procedures and improve the yield will be implemented.

**Implementation Plan
(timeline):**

Key/Responsible

Personnel:

Hisako Masuda

Measures:

Subsequent assessment

Supporting Attachments:

Measure

Collection of relevant data: C126

PROGRAM LEVEL; DIRECT - STUDENT ARTIFACT

Details/Description :

This outcome was assessed last year. Because of the limited number of students in the major, it is being assessed again this year and the data combined with last year's. Component 1. Collection and organization of relevant data.

Students were expected to successfully perform a titration in the lab. This was the last of several titrations they had performed over the course of the 2-semester lab sequence.

Components 2, 3, 4 Analyze experimental data appropriately, Interpretation of processed data. Identification of experimental errors.

The lab report that students submit for this experiment is a measure of their ability to do all three.

Acceptable Target :

80%

Implementation Plan (timeline):

Key/Responsible Personnel:

Sara Deyo

Supporting Attachments:

Findings

for Collection of relevant data: C126

Summary of Findings :

There were 5 chemistry or biochemistry majors in the three sections.

- 1 Freshman
- 2 Sophomore
- 1 Junior
- 1 Senior

Component 1: 5 of 5 (100%) of chemistry/biochemistry students were able to successfully perform the titration and collect a reasonable set of data

Component 2-4: The average grade on the Water Hardness (titration) lab was 46/50 (92%)

Acceptable Target Achievement:

Met

Reflections/Notes :

Continue to emphasize the importance of proper technique when performing titrations all year. The students know ahead of time that the data they collect for this experiment will be held to a higher standard than for the first few titrations. That almost always produces excellent titration results.

Substantiating Evidence:

Action

in 2016 -2017 Academic year Data or 2016 Calendar year data - Action Plan

C126 Actions

No Status Added to C126 Actions

Action details:

Continue to emphasize the importance of proper technique when performing titrations all year. The students know ahead of time that the data they collect for this experiment will be held to a higher standard than for the first few titrations. That almost always produces excellent titration results.

Implementation Plan

(timeline):

Key/Responsible

Personnel:

Sara Deyo

Measures:

Subsequent assessment

Measure

Fall 2016 Chemistry C343 – Organic Chemistry Laboratory 1 Chemistry Assessment

PROGRAM LEVEL; DIRECT - STUDENT ARTIFACT

Details/Description :

Component 1. Collection and organization of relevant data.

-Chromatography technique lab: the ability to run TLCs (thin layer chromatograms) and transfer accurate images of them into the lab notebook.

Component 2. Analyze experimental data appropriately.

-Final Exam, question 5a: correctly calculating Rf values for spots on a TLC plate.

Component 3. Interpretation of processed data.

-Final Exam, questions 5bc: compound polarity determinations and practical implications with respect to TLC and column chromatography.

Component 4. Identification of experimental errors.

-Final Exam, question 1a: issues resulting from improperly performed hot filtration during recrystallization.

Acceptable Target :

Implementation Plan (timeline):

Key/Responsible Personnel:

Denise Chauret

Supporting Attachments:

Findings

for Fall 2016 Chemistry C343 – Organic Chemistry Laboratory 1 Chemistry Assessment

Summary of Findings :

Component 1: 100% of chemistry/biochemistry students and 100% of other students were able to spot and run TLCs properly, and transfer images of them into their lab notebooks.

Component 2: The Final Exam question regarding Rf value calculation was answered 79% correctly by chemistry/biochemistry students and 90% correctly by other students.

(Answering the question at least 70% correct: 67% of chem/biochem students 89% of other students)

Component 3: The Final Exam question regarding compound polarity determinations, with practical implications was answered 67% correctly by chemistry/biochemistry students and 86% correctly by other students.

(Answering the question at least 70% correct: 50% of chem/biochem students 78% of other students)

Component 4: The Final Exam question regarding identification of errors resulting from improperly performed hot filtration was answered 67% correctly by chemistry/biochemistry students and 81% correctly by other students.

(Answering the question at least 70% correct: 50% of chem/biochem students 78% of other students)

Acceptable Target Achievement:

Not Met

Reflections/Notes :

Of 24 students in the two lab sections, 6 were chemistry or biochemistry majors. These students ranged from sophomore to senior.

Plan of action: Make an effort to ensure continued motivation of chemistry/biochemistry students to perform at their highest possible level, and encourage them to ask questions when they do not understand a technique or concept.

Substantiating Evidence:

Action

in 2016 -2017 Academic year Data or 2016 Calendar year data - Action Plan

C343 Actions

No Status Added to C343 Actions

Action details:

Make an effort to ensure continued motivation of chemistry/biochemistry students to perform at their highest possible level, and encourage them to ask questions when they do not understand a technique or concept.

Implementation Plan

(timeline):

Key/Responsible

Personnel:

Denise Chauret

Measures:

Subsequent assessment

Supporting Attachments:

Measure

Interpretation of experimental data: C329

PROGRAM LEVEL; DIRECT - STUDENT ARTIFACT

Details/Description :

Method: In the lab report for green fluorescent protein purification, students analyzed the effectiveness of their purification procedure by DSD-PAGE and possible reasons for protein loss. Students were asked to demonstrate 1) purify a protein from a crude cellular extract. 2) analyze if the purified fractions contained the desired protein by SDS-PAGE and 3) write a lab report.

Acceptable Target :

80%

Implementation Plan (timeline):

Key/Responsible Personnel:

Hisako Masada

Supporting Attachments:

Findings

for Interpretation of experimental data: C329

Summary of Findings :

Biochemistry/Chemistry majors: 100% (4/4 students)

Biology/BIPH majors: 90% (8/9 students)

Acceptable Target Achievement:

Met

Reflections/Notes :

100% of Biochemistry and Chemistry majors achieved the goals. In the future, instructions to increase the efficacy of the protein purification procedures and improvement of the yield will be implemented.

Substantiating Evidence: