EVIDENCE TEAM REPORT
ILO 5 QUANTITATIVE LITERACY
ASSESSMENT AND REVIEW
Spring 2018

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## Institutional Learning Outcome Statement

Institutional Learning Outcome (ILO) 5 Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems. Examples of when students have demonstrated mastery of this ILO include, but are not limited to

- Performing calculations accurately.
- Interpreting mathematical models such as formulas, graphs, and tables.
- Applying mathematical concepts to solve problems.
- Creating and analyzing mathematical models to solve application problems.

## Previous Review

An evidence team reviewed this ILO in spring 2012. They developed a 4-point rubric to operationalize the ILO. Based on the rubric, they created a 3-point Likert rating scale to align with e-Lumen, the learning outcomes assessment and management system. The rating scale included a no-answer (0) category that was not included in overall scoring. They were one of the first teams to use e-Lumen data instead of gathering artifacts. Data came from a variety of courses representing several disciplines: chemistry (1 course), nursing (3 courses), computer science (3 courses), drama (2 courses), and mathematics (16 courses). They concluded that 796 out of 1061 (75%) scored a 2 or 3 (meets or exceeds expectations). They concluded that "many of the students taking the 500-level courses had additional challenges to learning like learning disabilities, poor study habits, test anxiety, etc. that hamper their ability to meet or exceed expectations (68%)".

Table 1. 2012 Evidence Team Report

| Course Level | Exceeds Expectations (3) | | Meets Expectations (2) | | Does not Meet Expectations (1) | | N/A (0) |
|---|---|---|---|---|---|---|---|
| 100 | 102 | 73% | 23 | 16% | 15 | 11% | 16 |
| 300 | 344 | 44% | 250 | 32% | 214 | 28% | 215 |
| 500 | 49 | 43% | 28 | 25% | 36 | 32% | 9 |
| **Total** | 495 | 47% | 301 | 28% | 265 | 25% | |

NOTE: Meets and Exceeds Expectations 796 (75%). The AHC benchmark: 70%.

## Intentional Actions for the Current Evidence Study

The 2018 evidence team study gathered data from various sources: discipline faculty, student surveys, and disaggregated data from e-Lumen. The information on student demographics used to disaggregate the e-Lumen data was provided by Banner, the enrollment management system. The team reviewed the quantitative literacy ILO and revised the rubric. Discipline faculty whose courses had student learning outcomes (SLOs) mapped to this ILO, provided input. The team asked the discipline faculty to review the quantitative literacy ILO, determine the appropriateness of CSLO mapping to the ILO, comment on the new quantitative literacy rubric, and provide feedback on the new student survey questions.

Also, the institutional research team conducted the data extracts and the student surveys in spring 2018. This evidence study adopted the same demographic groups from previous evidence studies (Appendix A: Descriptions of Demographic Categories).

# Purpose

The 2018 evidence team completed step C (assess outcomes per assessment plan, evaluate assessment results, and decide if outcomes met established goals) and step D (discuss areas of instruction or processes that could be changed to improve outcomes and implement changes) (Refer: Figure 1).
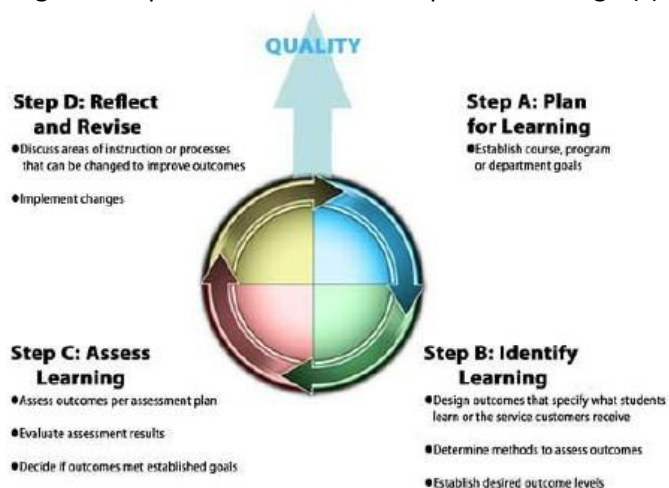


Figure 1. Diagram of the Student Learning Outcomes and Assessment Cycle

## Development of Rubrics

The 2012 rubric utilized the then current definition of quantitative literacy (ILO 5). In 2018, the rubric was revised to match the 3-point scales used in e-Lumen (3 = exceeds standards, 2 = meets standards, and 1 = does not meet standards) (Refer: Rubric 1: ILO 5: Quantitative Literacy).

Rubric 1. ILO 5: Quantitative Literacy

"Use mathematical concepts and models to analyze and solve real life issues or problems. Examples of when students have demonstrated mastery of this ILO include, but not limited to: "

|  | Exceeds (3) | Meets (2) | Does Not Meet (1) | N/A |
|---|---|---|---|---|
| Performing calculations accurately. | Consistently demonstrates the ability to accurately apply mathematical operations, properties, and the order of operations. | Generally, demonstrates the ability to accurately apply mathematical operations, properties, and the order of operations. | Fails to demonstrate the ability to accurately apply mathematical operations, properties, and the order of operations. | |
| Interpreting mathematical models such as formulas, graphs, and tables. | Interpretation of mathematical models is consistently precise and/or accurate. | Interpretation of mathematical models is generally accurate. | Interpretation of mathematical models is largely inaccurate, showing a basic lack of understanding. | |
| Applying mathematical concepts to solve problems. | Consistently demonstrates the ability to choose appropriate mathematical concepts. Consistently applies mathematical concepts accurately. | Generally, demonstrates the ability to choose appropriate mathematical concepts. Generally applies mathematical concepts accurately. | Unable to demonstrate the ability to choose appropriate mathematical concepts. Unable to apply mathematical concepts accurately. | |
| Creating and analyzing mathematical models to solve application problems. | Consistently able to create an appropriate mathematical model. Consistently able to analyze an appropriate mathematical model. | Generally able to create an appropriate mathematical model. Generally able to analyze an appropriate mathematical model. | Unable to demonstrate the ability to create appropriate mathematical model. Unable to demonstrate the ability to analyze an appropriate mathematical model. | |

## Course Re-mapping and Related Activities

In fall 2017, the evidence team communicated with the faculty through various means including electronic mail (Figure 2).

Figure 2. Email Template

Dear _____,

This year, we are reviewing and reassessing ILO # 5 (Quantitative Literacy)

Currently your course/s: _____ have SLOs mapped to this ILO. I have attached an Excel file for your reference.

The team reviewed the ILO language and updated the rubric.

Please take a few minutes to do the following:
1. Review the ILO. No changes are proposed to the language.
2. Review the rubric and comment.
3. Review your SLOs that map to this ILO. Mark the correct column.
   - Maintain my map. Put an X in this column if you got it correct the first time and wish to move on with the day.
   - Change my map. Put the number of the ILO you wish to switch to in this column if somehow a mistake in mapping was made.

Please respond with your Excel file by _____ so I can provide your input to the team.

On behalf of the ILO Team,
Thank you

Some departments asked a team member to visit and discuss the ILO, the rubric and the survey questions. These departments included the mathematical sciences department and industrial technology.

## Methodology

*Course Mapping.* The evidence team encouraged the discipline faculty to review their course SLO mapping to the quantitative literacy ILO. The faculty had the option to maintain their current mapping, change to a different ILO, or modify the course SLOs.

*Data Gathering and Disaggregation.* E-Lumen generated data on all assessment measures from fall 2010 to spring 2018 inclusively. With extracts from Banner, the data were disaggregated by age, gender, ethnicity, and various students groups such as: first generation college students, foster youth (Cooperating Agencies Foster Youth Educational Support – CAFYES), veteran (Free Application for Federal Student Aid – FAFSA), California Board of Governors (BOG) fee waiver, California Work Opportunity and Responsibility to Kids (CalWORKs), Cooperative Agencies Resources for Education (CARE), Extended Opportunity Programs and Services (EOPS), Mathematics Engineering Science Achievement (MESA), and Disabled Student Programs and Services (DSPS).

*Student Input.* The Associated Student Body Government (ASBG) and Science Technology Engineering Mathematics (STEM) student groups provided inputs to the quantitative literacy survey questions (Refer: Appendix B: Student Survey Questions).

# Evidence

## *Direct Evidence*

Faculty Response and Course SLO Mapping.

- Eight departments had courses that were mapped to ILO 5 namely: Applied Behavioral Sciences, Fine Arts, Business, Social Behavioral Sciences, Life and Physical Sciences, Health Sciences, Industrial Technology, and Mathematical Sciences. The Mathematical Sciences Department had the most number of courses and generated the most data points. The mathematics CSLOs are in the process of review and possible revision.
- Eighty-nine courses had one-hundred seventy-eight CSLOs. One course, MATH 184, listed seven SLOs to the quantitative literacy ILO.
- Most faculty responded to the request to the review of the course SLOs, mapping, and ILO 5 rubric.

E-lumen generated 8,613 data points for quantitative literacy ILO from fall 2010 to spring 2018. About seventy four percent (73.87% = 6,362 data points) exceeded/met the standards and about twenty-six percent (26.13% = 2,251 data points) were below standards. The data indicated that the college met the established benchmark of 70% for this specific ILO.

Table 2: ILO 5 Summary: All Groups

|  | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|
| All Categories | 6,362 | 73.87% | 2,251 | 26.13% |

To identity disproportionate impact the team further examined several student groups which are shown.

Students self-reported groups include: age, ethnicity, and gender. Standard demographic intervals defined age groupings and ethnicity.

Table 3: ILO 5 and Student Self-Reported Categories (Age, Ethnicity, and Gender)

| | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|
| Under 20 | 2,664 | 72.99% | 986 | 27.01% |
| 20-24 | 1,394 | 79.93% | 350 | 20.07% |
| 25-34 | 411 | 77.26% | 121 | 22.74% |
| 35-54 | 52 | 83.87% | 10 | 16.13% |
| **55 – over** | **1,835** | **70.06%** | **784** | **29.94%** |
| Overall | 6,356 | 73.85% | 2251 | 26.15% |

The **55 years and over** age group was identified as disproportionately impacted. The exceeds/meets standards percentage (70.06%) for this group is more than 3% points lower than the overall exceeds/meets standards percentage (73.85%).

| | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|
| American Indian/Alaskan | 79 | 77.45% | 23 | 22.55% |
| Asian | 236 | 77.89% | 67 | 22.11% |
| Black Non-Hispanic | 130 | 74.71% | 44 | 25.29% |
| Filipino | 285 | 78.30% | 79 | 21.70% |
| **Hispanic** | **3,580** | **70.47%** | **1500** | **29.53%** |
| Other Non-White | 0 | 0% | 0 | 0 |
| **Pacific Islander** | **34** | **69.39%** | **15** | **30.61%** |
| Unknown / Undeclared | 31 | 86.11% | 5 | 13.89% |
| White Non-Hispanic | 1,974 | 79.28% | 516 | 20.72% |
| Overall | 6,349 | 73.84% | 2,249 | 26.16% |

Two ethnic groups are disproportionately impacted. The **Hispanic** group exceeds/meets standard percentage (70.47%) is more than 3% points lower than the overall exceeds/meets standards percentage (73.84%) for all ethnic groups. This group had the most data points of any ethnic group.

The **Pacific Islander** group is below the 70% college benchmark. Please see the analysis section for a discussion on disproportionate impact.

|  | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|
| Male | 3,170 | 73.93% | 1,118 | 26.07% |
| Female | 3,182 | 73.78% | 1,131 | 26.22% |
| Unknown | 7 | 87.50% | 1 | 12.50% |
| Overall | 6,359 | 73.86% | 2,250 | 26.14% |

Both male and female exceeds/meets standards percentages are within 3% points of the overall percentage.

The next tables include groups that are often mentioned when examining disproportionate impact, include first generation college students, foster youth and veterans.

Table 4: ILO 5: First Generation College Students, Foster Youth, and Veterans

|  | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|

**Category: First Generation College Students and College Achievement Now (CAN) (Fall 2010-Fall 2016)**

|  | | | | |
|---|---|---|---|---|
| Yes | 257 | 68.53% | 118 | 31.47% |
| No | 6,103 | 74.11% | 2,132 | 25.89% |
| Overall | 6,360 | 73.87% | 2,250 | 26.13% |

The **first-generation college students**, a self-reported group, was identified as disproportionately impacted. The exceeds/meets standards percentage (68.53%) for this group is more than 5% points lower than the overall exceeds/meets standards percentage (73.87%). It also did not meet the college benchmark of 70%.

**Category: Foster Youth and Cooperating Agencies Foster Youth Educational Support (CAFYES) (Fall 2010-Fall 2016)**

|  | | | | |
|---|---|---|---|---|
| Yes | 106 | 71.14% | 43 | 28.86% |
| No | 6,254 | 73.91% | 2,208 | 26.09% |
| Overall | 6,360 | 73.86% | 2,251 | 26.14% |

There is no identified disproportionate impact. The exceeds/meets standards percentage (71.14%) for the foster youth and CAFYES is within 3% points of the overall exceeds/meets standards percentage (73.86%).

**Category: Veterans (Fall 2010-Fall 2016)**

|  | | | | |
|---|---|---|---|---|
| Yes | 152 | 78.35% | 42 | 21.65% |
| No | 6,209 | 73.76% | 2,209 | 26.24% |
| Overall | 6,361 | 73.86% | 2,251 | 26.14% |

There is no identified disproportionate impact. The exceeds/meets standards percentage (78.35%) for the veterans is more than 3% points higher than the overall exceeds/meets standards percentage (73.86%).

The group examined two programs on campus that students can apply for, MESA and DSPS.

Table 5: ILO 5: Mathematics Engineering Science Achievement (MESA) Program and Disabled Students Programs and Services (DSPS)

|  | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|

**Category: Mathematics Engineering Science Achievement (MESA) Program (Fall 2010-Fall 2016)**

|  | | | | |
|---|---|---|---|---|
| Yes | 47 | 66.20% | 24 | 33.80% |
| No | 6,312 | 73.92% | 2,227 | 26.08% |
| Overall | 6,359 | 73.86% | 2,251 | 26.14% |

The **MESA** group is below the 70% college benchmark. Please see the analysis section for a discussion on disproportionate impact.

**Category: Disabled Students Programs and Services (DSPS) (Fall 2010-Fall 2016)**

|  | | | | |
|---|---|---|---|---|
| Yes | 333 | 66.87% | 165 | 33.13% |
| No | 6,027 | 74.29% | 2,086 | 25.71% |
| Overall | 6,360 | 73.85% | 2,251 | 26.15% |

The **DSPS** group is disproportionately impacted. The exceeds/meets standard percentage (66.87%) of the group is almost 7% points lower than the overall exceeds/meets standards percentage (73.85%). It also did not meet the college benchmark of 70%.

Lastly the team discussed the various service programs on campus that are utilized by many of our students, BOG, CalWORKS, CARE and EOPS,

Table 6: ILO 5: Eligibility for Board of Governors, California Work Opportunity and Responsibility to Kids (CalWORKS), Cooperative Agencies Resources for Education (CARE), and Extended Opportunity Programs and Services (EOPS)

| | Exceeds/Meets Standards | | Below Standards | |
|---|---|---|---|---|

**Category: Board of Governors (BOG) Fee Waiver Eligibility (Fall 2010-Fall 2016)**

| | | | | |
|---|---|---|---|---|
| Yes | 4,630 | 73.26% | 1,690 | 26.74% |
| No | 1,732 | 75.57% | 560 | 24.43% |
| Overall | 6,362 | 73.87% | 2,250 | 26.13% |

There is no identified disproportionate impact. The exceeds/meets standards percentages for the BOG eligibility are within 3% points of the overall exceeds/meets standards percentage.

**Category: California Work Opportunity and Responsibility to Kids (CalWORKs) Eligibility (Fall 2010-Fall 2016)**

| | | | | |
|---|---|---|---|---|
| Yes | 84 | 81.55% | 19 | 18.45% |
| No | 6,275 | 73.76% | 2,232 | 26.24% |
| Overall | 6,359 | 73.86% | 2,251 | 26.14% |

There is no identified disproportionate impact. The exceeds/meets standards percentage for the CARE eligibility students is higher than the overall exceeds/meets standards percentage.

**Category: Cooperative Agencies Resources for Education (CARE) Eligibility (Fall 2010-Fall 2016)**

| | | | | |
|---|---|---|---|---|
| Yes | 76 | 80% | 19 | 20.00% |
| No | 6,283 | 73.79% | 2,232 | 26.21% |
| Overall | 6,359 | 73.86% | 2,251 | 26.13% |

There is no identified disproportionate impact. The exceeds/meets standards percentage for the CARE eligibility students is higher than the overall exceeds/meets standards percentage.

**Category: Extended Opportunity Programs and Services (EOPS) Eligibility (Fall 2010-Fall 2016)**

| | | | | |
|---|---|---|---|---|
| Yes | 615 | 73.13% | 226 | 26.87% |
| No | 5,747 | 73.94% | 2,025 | 26.06% |
| Overall | 6,362 | 73.87% | 2,251 | 26.13% |

There is no identified disproportionate impact. The exceeds/meets standards percentages for the EOPS eligibility students are within the 3% points of the overall exceeds/meets standards.

## *Indirect Evidence*

The student self-report survey was disseminated by RAVE email and learning management system (Canvas) message. It was conducted for two weeks during the middle part of the 2018 spring term.

Table 11: Student Survey Results.

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to perform calculations accurately.** | Strongly Agree | | Agree | | Disagree or Strongly disagree | | Total |
|---|---|---|---|---|---|---|---|
| I am able to perform calculations with whole numbers. | 735 | 66% | 321 | 29% | 62 | 6% | 1,118 |
| I am able to perform calculations with decimals. | 607 | 54% | 412 | 37% | 95 | 9% | 1,114 |
| I am able to perform calculations with fractions. | 465 | 42% | 448 | 40% | 200 | 18% | 1,113 |
| I am able to work with percentages. | 505 | 45% | 451 | 40% | 159 | 14% | 1,115 |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to interpret mathematical models such as formulas, graphs, and tables.** | Strongly Agree | | Agree | | Disagree or Strongly disagree | | Total |
|---|---|---|---|---|---|---|---|
| I am able to use formulas. | 502 | 46% | 441 | 40% | 157 | 14% | 1,100 |
| I am able to read and understand graphs. | 485 | 44% | 496 | 45% | 115 | 10% | 1,096 |
| I am able to read and understand tables. | 519 | 47% | 462 | 42% | 112 | 10% | 1,093 |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to apply mathematical concepts to solve problems.** | Strongly agree | | Agree | | Disagree or Strongly disagree | | Total |
|---|---|---|---|---|---|---|---|
| I know which mathematical concepts or ideas to use in solving problems. | 321 | 29% | 560 | 51% | 213 | 19% | 1,094 |
| I can apply mathematical concepts or ideas to solve problems. | 365 | 33% | 543 | 50% | 184 | 17% | 1,092 |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to create and analyze mathematical models to solve application problems.** | Strongly agree | | Agree | | Disagree or Strongly disagree | | Total |
|---|---|---|---|---|---|---|---|
| I am able to create a formula as it relates to real world situations. | 248 | 23% | 483 | 46% | 325 | 31% | 1,056 |
| I am able to create a table as it relates to real world situations. | 345 | 33% | 499 | 47% | 207 | 20% | 1,051 |
| I am able to create a graph as it relates to real world situations. | 341 | 33% | 500 | 48% | 208 | 20% | 1,049 |
| I am able to analyze mathematical models of real world application. | 273 | 26% | 476 | 45% | 305 | 29% | 1,054 |
| I am able to make conclusions from mathematical models of real world application. | 292 | 28% | 494 | 47% | 265 | 25% | 1,051 |

## Summary of Student Responses

| Dimension | Strongly Agree | | Agree | | Strongly Disagree | |
|---|---|---|---|---|---|---|
| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to perform calculations accurately**. | 2312 | 51.84% | 1632 | 36.60% | | |
| | **3944** | | **88.44%** | | 516 | 11.56% |
| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to interpret mathematical models such as formulas, graphs, and tables**. | 1506 | 45.79% | 1399 | 42.54% | | |
| | **2905** | | **88.33%** | | 384 | 11.67% |
| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to apply mathematical concepts to solve problems**. | 686 | 31.38% | 1103 | 50.46% | | |
| | **1789** | | **81.84%** | | 397 | 18.16% |
| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability **to create and analyze mathematical models to solve application problems**. | 1499 | 28.49% | 2452 | 46.61% | | |
| | **3951** | | **75.1%** | | 1310 | 24.90% |

Table 12: Student Survey Demographics

**GENDER**

| | | |
|---|---|---|
| Male | 366 | 38% |
| Female | 574 | 59% |
| Decline to state | 31 | 3% |
| **Total** | **971** | **100%** |

**ETHNICITY**

| | | |
|---|---|---|
| Asian | 55 | 5% |
| African American or Black | 23 | 2% |
| Hispanic or Latino | 490 | 43% |
| American Indian or Alaska Native | 19 | 2% |
| Native Hawaiian/Pacific Islander | 22 | 2% |
| White | 376 | 33% |
| Two or more races | 107 | 9% |
| Unknown / Non-respondent | 42 | 4% |
| **Total** | **1,134** | **100%** |

**AGE**

| | | |
|---|---|---|
| <18 years | 56 | 6% |
| 18-24 years | 512 | 53% |
| 25-34 years | 176 | 18% |
| 35-44 years | 96 | 10% |
| 45-55 years | 69 | 7% |
| >55 years | 59 | 6% |
| **Total** | **968** | **100%** |

**ACADEMIC LOAD**

| | | |
|---|---|---|
| Part-time (less than 12 units) | 579 | 60% |
| Full-time (12 or more units) | 382 | 40% |
| **Total** | **961** | **100%** |

**TOTAL UNITS EARNED AT AHC** (not including current courses)

| | | |
|---|---|---|
| None | 91 | 9% |
| 1-14 units | 258 | 27% |
| 15-29 units | 140 | 14% |
| 30-45 units | 105 | 11% |
| 46 or more units | 290 | 30% |
| Don't know | 82 | 8% |
| **Total** | **966** | **100%** |

**Analysis**

*e-Lumen Data Analysis*

- The data points for ILO 5 Quantitative Literacy indicate that 73.87 % exceed or meet the standards and meet the college benchmark of 70%.
- Disproportionate impact is based on the percentage point gap. The percentage point gap is the difference between the overall percentage meeting the goal and the percentage of each subgroup reaching the same goal (Refer: Appendix C: Disproportionate Impact). It exists when the subgroup percentage is three percentage points lower than the overall percentage.
  o Generally, larger subgroups will require working with larger student groups to increase the number of data points in the exceeds/meets category, to correct the disproportionate impact.
  o The 55 years and over age group was identified as disproportionately impacted. The exceeds/meets standards percentage (70.06%) for this group is more than 3% lower than the overall exceeds/meets standards percentage (73.85%). Since the cohort is seventy percent, if approximately one percent of the 2,619 data points (about 26 data points) are added to the exceeds or meets the standards, the 55 and over group will no longer be disproportionately impacted.  This group also scored themselves lower on the student survey please see the Appendix D.
  o Two ethnic groups are disproportionately impacted.
    ▪ The Hispanic group exceeds/meets standard percentage (70.47%) is more than 3% points lower than the overall exceeds/meets standards percentage (73.84%) for all ethnic groups. This group had the most data points of any ethnic group. Increasing the Hispanic subgroup by 0.5% points, 26 more data points are needed to alleviate the disproportionate impact.
    ▪ The Pacific Islander exceeds/meets standards percentage (69.39%) did not meet the college benchmark of 70%.  When you correct for sample size, this group did not have enough students to detect a statistically significance difference based on a 95% confidence interval, so they would not be considered a disproportionately impacted group.   The group decided to leave them in due to not meeting the benchmark.
  o Examining various student groups on campus, three of them showed disproportional impact.
    ▪ The first-generation college students, a self-reported group, is identified as disproportionately impacted. The exceeds/meets standards percentage (68.53%) for this group is more than 5% points lower than the overall exceeds/meets standards percentage (73.87%). This group did not meet the college benchmark of 70%.  To increase the first-generation students up by 2.5% points, 10 more data points are needed.
    ▪ The MESA exceeds/meets standards percentage (66.20%) did not meet the college benchmark of 70%.  When you correct for sample size, this group did not have enough students to detect a statistically significance difference based on a 95% confidence interval, so they would not be considered a disproportionately impacted group. The team recognizes that the small sample size may affect the data and the team felt that these students are evaluated on much tougher quantitative literacy questions than the general population so may have not achieved the desired goal for the class.
    ▪ The DSPS group is also disproportionately impacted. The exceeds/meets standard percentage (66.87%) of the group is almost 7% points lower than the overall exceeds/meets standards percentage (73.85%). It also does not meet the college benchmark of 70%.  To increase DSPS students by 7%, 35 more data points need to move to the meets or exceeds category.

*Student Survey Analysis*
- There were 1,134 responses to the student survey.
- The respondents were mostly female (59%), Hispanic or Latino (43%), 18-24 years old (53%), part-time with less than 12 units (60%), and a combination of students who just started with 1-14 units (27%) or 46 or more units (30%) into their program of study. Institutional Effectiveness deemed the respondent demographic characteristics to be representative of the college's student body.
- The respondents reported that they demonstrated the quantitative literacy skills at 75.1%-88.4%.
- Student respondents reported "disagree" or "strongly disagree", which was matched to "below standard" on two specific questions: "I am able to create a formula as it relates to real world situations" (31%) and "I am able to analyze mathematical models of real world application" (29%). The team had reservations in drawing conclusions due to inadequate data on factors that affected the student responses or lack of defined benchmark on student survey responses.

## Recommendations and Subsequent Actions

The 2018 evidence team recommends:
1) Consider teaching strategies and supportive resources to enhance student attainment of the quantitative literacy ILO.
2) Continue periodic review of the institutional learning outcomes. The current study would drive actions to further improve instruction to enhance student quantitative literacy.
3) Seek other evidence to measure student learning outcomes at the course, program, and institutional levels. The current data extrapolated course SLO data to the ILO. There was no measure of student attainment of program learning outcomes (PLOs).
4) Encourage development of student assessment measures that closely align with the PLOs and ILOs.
5) Continue student involvement in creating and conducting surveys. Identify more opportunities to involve students and resources used by students (STEM, MESA, and Math Center) when assessing ILOs.
6) Continue collaboration with the institutional research team on future ILO evidence studies.
7) Establish best practices and benchmarks for student surveys.

## Acknowledgement

The 2018 evidence team expresses the deepest gratitude to
- Erica Biely, Senior Research & Planning Analyst, for facilitating the design and launch of the student survey, for attending meetings to help the faculty better understand the results of the student survey, and her overall continued and timely support.
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# References

Allan Hancock College Learning Outcomes and Assessment Committees – Academic Affairs (LOAC- AA). (2014, March). AHC Institutional Assessment Plan.

Allan Hancock College. (2012, Spring). Quantitative Literacy Evidence Team Report.

Appendix A: Descriptions of Demographic Categories

Students self-identify age, gender, and ethnicity.

| Age categories are: | Ethnicity categories are: | Gender |
| --- | --- | --- |
| • Unknown | • Asian | • Male |
| • Under 20 | • Black Non-Hispanic | • Female |
| • 20-24 | • Filipino | • Other |
| • 25-34 | • Hispanic | • Unknown |
| • 35-54 | • White Non-Hispanic | |
| • 55 and over | • Other Non-White | |
| | • Pacific Islander | |
| | • American Indian/Alaskan Native | |
| | • Unknown / Undeclared | |

The **College Achievement Now (CAN)** program is federally-funded by the US Department of Education, TRIO Student Support Services grant. It provides a variety of services to students who are **first generation**, economically disadvantaged, and students with disabilities evidencing academic need. The purpose of the program is to increase retention rates, increase transfer rates to a four-year, higher learning institution. The students are expected to keep a satisfactory overall grade-point-average, attend scheduled events, meet federally-mandated objectives, and complete their Allan Hancock College education in less than four years.

**First generation students** are the first person in their immediate family to attend college.

The **Cooperating Agencies Foster Youth Educational Support (CAFYES)** program is newly renamed "NextUp" by the California Community Colleges Chancellor's Office and "was chosen to help foster youth feel encouraged and excited about the next chapter of their lives". It provides "over and above" support services for current and former foster youth attending the college. It works in conjunction with EOPS to provide intake and assessment, academic counseling, peer mentoring, tutoring services, and computer lab access for homework, study time, and printing needs. It also assists in transportation, food court vouchers, and textbook purchase. The "**foster youth**" student eligibility includes:
• Current or former foster youth in California whose dependency was established or continued by the court on or after the sixteenth birthday;
• No older than 25 years of age at the commencement of any academic year in which s/he participated in CAFYES; and
• Eligible Extended Opportunity Programs and Services (EOPS) student who enrolled in at least nine units.

The **Veterans** Success Center provides assistance to prospective and enrolled student-veterans, and prospective and enrolled student-veteran-dependents, while also providing a welcoming environment for veterans that will aid in their transition to college. It assists students in accessing their GI benefits, completing admission application process, registering for classes, accessing college resources, getting involved in leadership activities, and transitioning into the civilian work world.

The **Mathematics, Engineering, and Science Achievement (MESA)** is an academic program that provides a wide range of support services and activities that are aimed at fostering student achievement and increasing the success and participation in pursuit of a mathematics, engineering, computer science,

biology, architecture, kinesiology, or other science-based programs. It enables students to prepare for and graduate from a four-year university with a math-based degree. It seeks to increase the diverse pool of transfer-ready community college students who are prepared to excel in math, engineering, and science majors. Through the program, the students develop academic and leadership skills, increase academic performance, and gain confidence in their abilities to compete academically and professionally.

The **Disabled Students Programs and Services (DSPS)**, (or Allan Hancock College's Learning Assistance Program), verifies and documents students with learning disabilities. It identifies the educational limitations that reduce the student's ability to participate in academic endeavors without additional specialized services. It provides reasonable accommodations, instruction, assessment, counseling, and advocacy.

The **California Board of Governors (BOG) Fee Waiver** program waives tuition fees to eligible students. The students are responsible for paying the college general fees like materials costs, health fees, and other fees.

The **California Work Opportunity and Responsibility to Kids (CalWORKS)**, a partnership between the college and the Department of Social Services, serves "Welfare to Work" recipients who are currently receiving CalWORKS cash aid assistance. It offers an array of supportive services designed to assist students in obtaining the education level they require to transition off cash assistance and ultimately achieve long-term self-sufficiency.

The **Cooperative Agencies Resources for Education (CARE)** is a state-funded program for single parents attending Allan Hancock College. It works in conjunction with Extended Opportunity Programs and Services (EOPS) to provide support services to students who receive CalWORKs (state cash aid) benefits in the household. The CARE center provides tutoring sessions, free computer and printing access, academic counseling, and a child-friendly environment.

The **Extended Opportunity Programs and Services (EOPS)** is a state-funded program designed to provide financial assistance, support, and encouragement for eligible low-income students. Eligible students can access book grants, cash grants, registration assistance, peer advising, career, academic, and personal counseling, workshops, annual social activities, network with four-year institutions, and assistance with completing financial aid applications.

## Appendix B: Student Survey Questions

This survey is a self-assessment of your gains on Institutional Learning Outcomes as a result of being a student at Allan Hancock College. This survey has been designed to help Allan Hancock College to get an understanding of what our students are learning during their time at the college. Please answer the questions as honestly as possible. The results from surveys like these are used for planning changes to courses and programs so it is important you give your honest opinion.

Allan Hancock College would like to know more about each student's abilities to use mathematical concepts and models to analyze and solve real life issues or problems.

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability to perform calculations accurately. | Strongly agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I am able to perform calculations with whole numbers. | | | | |
| I am able to perform calculations with decimals. | | | | |
| I am able to perform calculations with fractions. | | | | |
| I am able to work with percentages. | | | | |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability to interpret mathematical models such as formulas, graphs, and tables. | Strongly agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I am able to use formulas. | | | | |
| I am able to read and understand graphs. | | | | |
| I am able to read and understand tables. | | | | |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability to apply mathematical concepts to solve problems. | Strongly agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I know which mathematical concepts or ideas to use in solving problems. | | | | |
| I can apply mathematical concepts or ideas to solve problems. | | | | |

| As a result of your educational experience at Allan Hancock College, please respond to these statements about your ability to create and analyze mathematical models to solve application problems. | Strongly agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I am able to create a formula as it relates to real world situations. | | | | |
| I am able to create a table as it relates to real world situations. | | | | |
| I am able to create a graph as it relates to real world situations. | | | | |
| I am able to analyze mathematical models of real world application. | | | | |
| I am able to make conclusions from mathematical models of real world application. | | | | |

What is your gender?
- o  Male
- o  Female
- o  Decline to state

What is your race or ethnicity? Please check all that apply.
- o  Asian
- o  African American or Black
- o  Hispanic or Latino
- o  American Indian or Alaska Native
- o  Native Hawaiian or Pacific Islander
- o  White
- o  Two or more races
- o  Unknown or non-respondent

What is your age range?
- o  < 18 years old
- o  18-24 years old
- o  25-34 years old
- o  35-44 years old
- o  45-55 years old
- o  > 55 years old

Thinking about the current semester, are you currently enrolled full-time or part-time?
- o  Part-time (less than 12 units)
- o  Full-time (12 or more units)

How many total units have you earned at Allan Hancock College? Please do not include courses you are currently taking this semester.
- o  None
- o  1-14 units
- o  15-29 units
- o  30-45 units
- o  46 or more
- o  Don't know

Appendix C: Disproportionate Impact

The Percentage Point Gap method is the simplest way to understand the severity of inequity experienced by student populations. The formula compares the success rate in a particular outcome for a disaggregated subgroup to the success rate for all students. The Percentage Point Gap method subtracts the overall percentage from the percentage of the disaggregated subgroup. A negative percentage point gap means that the disaggregated subgroup has a lower success rate compared to the rate of all students. For large samples (at least 800 or more), a margin of error of 3% is used. When the sample size is between 100 to 800, the recommended margin of error is between 3% and 10%. If the sample size is 100 or below, then the margin of error should be greater than 10%.

For this analysis, eLumen data and survey data for ILO 5 was used to measure disproportionate impact. The margin of error was adjusted for each disaggregated group.

Appendix D: Disproportionate Impact Analysis of Student Survey Responses

The Percentage Point Gap is show along with the number of students who are "lost".  "Lost" indicates
how many student need to move from the "fails to meet" to "meet or exceeds" in eLumen.

| | eLumn Data | Survey Data |
|---|---|---|
| | **Disproportionate Impact & # of students "lost"** | **Disproportionate Impact by question** |
| Under 20 | -1, Lost Students=31 | -3.2%, I am able to perform calculations with whole numbers.<br>-1.4%, I am able to read and understand tables. |
| 20-24 | None | None |
| 25-34 | None | None |
| 35-44 | None | -1.2%, I am able to use formulas. |
| 45-54 | None | -4.6%, I am able to perform calculations with whole numbers.<br>-1.3%, I am able to perform calculations with decimals.<br>-1.1%, I am able to use formulas.<br>-5.7% I am able to read and understand tables<br>-1.3%, I know which mathematical concepts or ideas to use when solving problems.<br>-5.6%, I can apply mathematical concepts or ideas to solve problems.<br>-1.0%, I am able to create a formula as it relates to real world situations.<br>-5.2% I am able to create a table as it relates to real world situations.<br>-1.9%, I am able to create a graph as it relates to real world situations.<br>-6.5%, I am able to make conclusions from mathematical models of real world applications. |
| 55 - over | **-4%, Lost Students=99\*** | -4.7%, I am able to perform calculations with whole numbers.<br>-8.4%, I am able to perform calculations with decimals.<br>-2.5% I am able to perform calculations with fractions.<br>-1.1%, I am able to work with percentages<br>-11%, I am able to use formulas.<br>-5.4%, I am able to read and understand graphs<br>-8.9% I am able to read and understand tables<br>-11.9%, I know which mathematical concepts or ideas to use when solving problems.<br>**-14.3%, I can apply mathematical concepts or ideas to solve problems.\***<br>-5.6%, I am able to create a formula as it relates to real world situations.<br>-6.9% I am able to create a table as it relates to real world situations.<br>-6.6%, I am able to create a graph as it relates to real world situations. |

|  |  | **-16.8%, I am able to analyze mathematical models of a real world application. \***<br>**-16.5%, I am able to make conclusions from mathematical models of real world applications. \*** |
| --- | --- | --- |
| American Indian /Alaskan Native | None | None |
| Asian | None | -1.3%, I am able to analyze mathematical models of a real world application. |
| Black Non-Hispanic | None | -2.9%, I am able to perform calculations with whole numbers.<br>-2.0%, I am able to perform calculations with fractions.<br>-3.9%, I am able to perform calculations with decimals.<br>-2.7%, I am able to work with percentages.<br>-3.7%, I can apply mathematical concepts or ideas to solve problems. |
| Filipino | None | None |
| Hispanic | **-3%, Lost Students=171\*** | -2.0%, I am able to perform calculations with fractions.<br>-2.5%, I am able to work with percentages. |
| Other Non-White | None | None |
| Pacific Islander | -4%, Lost Students=2 | None |
| Unknown /Undeclared | None | None |
| White Non-Hispanic | None | None |
| Female | None | -2.9, I am able to perform calculations with whole numbers.<br>-1.0%, I am able to perform calculations with fractions.<br>-1.4%, I am able to work with percentages. |
| Male | None | None |
| Unknown | None | None |
| First Generation | **-5%, Lost Students=20\*** | N/A |
| Foster Youth | -3, Lost Students=4 | N/A |
| Veterans | None | N/A |
| MESA | -8%, Lost Students=5 | N/A |
| DSPS | **-7%, Lost Students=35\*** | N/A |
| BOG | None | N/A |
| CalWorks | None | N/A |
| CARE | None | N/A |
| EOPS | None | N/A |