**General Education Assessment: Scientific Literacy Results 2023-24**

# What do we mean by Scientific Literacy?

Virginia Western describes Scientific Literacy as the ability to apply the scientific method and related concepts and principles to make informed decisions and engage with issues related to the natural, physical, and social world.

A person who is scientifically literate can recognize and know how to use the scientific method, and to evaluate empirical information. A person who is scientifically literate can:

* Formulate a hypothesis
* Collect data
* Analyze data
* Draw accurate conclusions based on the data

# How do we assess Scientific Literacy?

Scientific Literacy was assessed by 1 direct method of assessment and 2 indirect methods of assessment.

## Direct Assessment Method

Scientific Literacy was assessed by faculty using a [rubric](#Rubric) on selected artifacts; this rubric can be found in Appendix A. The threshold of acceptability was that 75% of students would earn an average rating of 2.00. The target was that students would have an average score of 3.00 or above.

### Population for Direct Assessment Method

453 artifacts were assessed for 402 unique students for the Scientific Literacy General Education Assessment. This represents 8.7% of the target population, program placed students (n=4,600). The table below provides the respondent population’s gender, race/ethnicity, age range, degree type, and course modality.

Table Respondent Population Demographics

|  |  |  |
| --- | --- | --- |
| **Category** | **n** | **Percentage** |
| **Gender** |  |  |
| Female | 256 | 63.68% |
| Male | 139 | 34.58% |
| Not specified | 7 | 1.74% |
| **Race/ Ethnicity** |  |  |
| Asian | 20 | 4.98% |
| Black | 40 | 9.95% |
| Hawaiian/Pacific Islander | \* | 0.25% |
| Hispanic | 34 | 8.46% |
| Not Specified | 10 | 2.49% |
| Two or More | 21 | 5.22% |
| White | 276 | 68.66% |
| **Age Range** |  |  |
| 19 or younger | 202 | 50.25% |
| 20-24 | 117 | 29.10% |
| 25 or older | 83 | 20.65% |
| **Degree Type** |  |  |
| AA | 5 | 1.24% |
| AAS | 13 | 3.23% |
| AS | 244 | 60.70% |
| CERT | \* | 0.50% |
| CSC | 138 | 34.33% |
| **Modality\*\*** |  |  |
| Face-to-Face | 298 | 65.78% |
| Hybrid | 10 | 2.21% |
| Online Asynchronous | 145 | 32.01% |
| *Notes: \* n is less than 5; \*\* students in multiple modalities* | | |

## Indirect Assessment Method 1

To assess scientific literacy for graduates, a [graduation survey](#Grad) was conducted which asked graduates to rate their satisfaction with the scientific literacy education they received while at Virginia Western on a scale from 1 (“Very Dissatisfied) to 4 (“Very Satisfied”); this survey question can be found in Appendix B. The threshold of acceptability was that 85% of respondents would rate their satisfaction with their scientific literacy education as a 3.00 or better. The target for this measure was that graduates would have an average scientific literacy satisfaction score of 3.00 or better.

### Population for Indirect Assessment Method 1

The sample population was 680 with 210 graduates responding. This is a response rate of 30.9%.

Table 2 Respondent Population Demographics

|  |  |  |
| --- | --- | --- |
| **Category** | **n** | **Percentage** |
| **Gender** |  |  |
| Female | 159 | 75.71% |
| Male | 49 | 23.33% |
| Not specified | \* | 0.95% |
| **Race/ Ethnicity** | |  |
| Asian | 6 | 2.86% |
| Black | 30 | 14.29% |
| Hawaiian/Pacific Islander | \* | 0.48% |
| Hispanic | 13 | 6.19% |
| Not Specified | 5 | 2.38% |
| Two or More | 9 | 4.29% |
| White | 146 | 69.52% |
| **Age Range** |  |  |
| 19 or younger | 31 | 14.76% |
| 20-24 | 100 | 47.62% |
| 25 or older | 79 | 37.62% |
| **Degree Type** | |  |
| AA | 7 | 3.33% |
| AAS | 112 | 53.33% |
| AS | 60 | 28.57% |
| CERT | \* | 0.95% |
| CSC | 29 | 13.81% |
| *Notes: \* n is less than 5* | | |

## Indirect Assessment Method 2

To assess scientific literacy with the alumni population, Virginia Western conducted an [alumni survey](#Alumni) which asked alumni to rate their satisfaction with the scientific literacy education they received while at Virginia Western on a scale from 1 (“Very Dissatisfied”) to 5 (“Very Satisfied”); this survey question can be found in Appendix B. The threshold of acceptability was that 85% of respondents would rate their satisfaction with their scientific literacy education as a 3.00 or better. The target for this measure was that alumni would have an average scientific literacy satisfaction score of 4.00 or better.

### Population for Indirect Assessment Method 2

The 2,442 individuals who either graduated during the 2020-2021 academic year or who attended during the 2020-2021 academic year and did not return for the 2021-2022 academic year were sent the survey. 131 individuals (5.4%) responded to the survey.

Table 3 Respondent Population Demographics

|  |  |  |
| --- | --- | --- |
| **Category** | **n** | **Percentage** |
| **Gender** |  |  |
| Female | 83 | 63.36% |
| Male | 46 | 35.11% |
| Not specified | \* | 1.53% |
| **Race/ Ethnicity** |  |  |
| Asian | \* | 3.05% |
| Black | 14 | 10.69% |
| Hispanic | 8 | 6.11% |
| Not Specified | \* | 2.29% |
| Two or More | \* | 1.53% |
| White | 100 | 76.34% |
| **Age Range** |  |  |
| 19 or younger | 8 | 6.11% |
| 20-24 | 52 | 39.69% |
| 25 or older | 71 | 54.20% |
| **Degree Type** |  |  |
| AA | \* | 3.05% |
| AAS | 34 | 25.95% |
| AS | 34 | 25.95% |
| CERT | 5 | 3.82% |
| CSC | 54 | 41.22% |
| **Graduation Status** |  |  |
| Did Not Graduate | 39 | 29.77% |
| Graduated | 92 | 70.23% |
| *Notes: \* n is less than 5* | | |
|  | | |

# What were our results?

## Direct Assessment:

Method 1: Artifacts-based Assessments

**Overall**

453 artifacts were assessed across 402 students. Artifacts measured one or more of the scientific literacy learning objectives below and are counted for each learning objective that was assessed. As depicted in Table 1 below, 91.2% of the artifacts met the threshold score of 2.00 for scientific literacy; this exceeds the 75% threshold of acceptability. Additionally, with an average artifact score of 3.13, the target artifact score of 3.00 was achieved.

Table 1. Scientific Literacy by Individual Student Learning Outcomes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed\* (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Scientific Literacy** | **1726** | **3.13** | **1574** | **91.2%** |
| Analyze Data | 453 | 3.20 | 425 | 93.8% |
| Collect Data | 435 | 3.19 | 398 | 91.5% |
| Draw accurate conclusions based on data | 453 | 3.08 | 414 | 91.4% |
| Formulate a Hypothesis | 385 | 3.03 | 337 | 87.5% |

\* Artifact counted for each learning outcome that it assesses/it is assessed for.

Below, artifact results are disaggregated by modality, gender, race/ethnicity, age range, and award type. Artifact scores were calculated by averaging the student learning outcome scores assessed, which is why the average score and/or percent that met the threshold may be different than that shown in Table 1.

**Modality**

Scientific Literacy was assessed across three modalities – face-to-face, hybrid, and online asynchronous sections. As depicted in Table 2 below, all modalities met the 75% threshold of acceptability for percentage of students that met the threshold score of 2.00 – 93.3% of students in face-to-face sections met the threshold (N=298), 90.0% of students enrolled in hybrid sections met the threshold (N=10), and 82.1% of students enrolled in online asynchronous sections met the threshold (N=145). The average score met the target score of 3.00 in face-to-face and hybrid modalities (3.26 and 3.28, respectively). Online asynchronous modality met the threshold score of acceptability (2.00) with an average score of 2.79.

Table 2. Scientific Literacy by Modality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **453** | **3.11** | **406** | **89.6%** |
| Face-to-Face | 298 | 3.26 | 278 | 93.3% |
| Hybrid | 10 | 3.28 | \* | 90.0% |
| Online Asynchronous | 145 | 2.79 | 119 | 82.1% |

\* Sample size is less than ten students

**Gender**

As depicted in Table 3 below, all genders met the 75% threshold of acceptability for percentage of students who met the threshold score of 2.00 – 87.0% of female students met the threshold (N=284), 93.8% of male students met the threshold (N=161), and 100.0% students with unspecified gender met the threshold (N=\*). Table 3 also establishes the average score met the target score of 3.00 for females, males, and unspecified students (3.07, 3.16, and 3.31, respectively).

Table 3. Scientific Literacy by Gender

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **453** | **3.11** | **406** | **89.6%** |
| Female | 284 | 3.07 | 247 | 87.0% |
| Male | 161 | 3.16 | 151 | 93.8% |
| Not Specified | \* | 3.31 | \* | 100.0% |

\* Sample size is less than ten students

**Race/Ethnicity**

As depicted in Table 4 below, all races except for Hawaiian/Pacific Islander met the 75% threshold of acceptability for percentage of students who met the threshold score of 2.00 – 87.5% of Asian students met the threshold (N=24), 83.7% of Black students met the threshold (N=43), 92.3% of Hispanic students met the threshold (N=39), 100.0% of students with an unspecified race/ethnicity met the threshold (N=10), 100.0% of students who identify as two or more races met the threshold (N=24), and 89.4% of White students met the threshold (N=312).

As shown in Table 4, the average score met the target score of 3.00 for Asian, Hispanic, non-specified race, two or more race, and White students (3.28, 3.17, 3.50, 3.25, and 3.11, respectively). Black students met the threshold score of acceptability (2.00) with an average score of 2.85.

Hawaiian/Pacific Islander students did not meet the threshold of acceptability for the percentage of students who met the threshold score of 2.00 (0.0%) or the overall average score (1.75). It should be noted that this subset of students has a sample size less than ten.

Table 4. Scientific Literacy by Race/Ethnicity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **453** | **3.11** | **406** | **89.6%** |
| Asian | 24 | 3.28 | 21 | 87.5% |
| Black | 43 | 2.85 | 36 | 83.7% |
| Hawaiian/Pacific Islander | \* | 1.75 | \* | 0.0% |
| Hispanic | 39 | 3.17 | 36 | 92.3% |
| Not Specified | 10 | 3.50 | 10 | 100.0% |
| Two or More | 24 | 3.25 | 24 | 100.0% |
| White | 312 | 3.11 | 279 | 89.4% |

\* Sample size is less than ten students

**Age Range**

As depicted in Table 5 below, all age ranges met the 75% threshold of acceptability for percentage of students who met the threshold score of 2.00 – 92.1% of students 19 or younger met the threshold (N=227), 87.4% of students aged 20-24 met the threshold (N=135), and 86.8% of students 25 or older met the threshold (N=91). Table 5 also establishes the average score met the target score of 3.00 for students 19 or younger, 20-24, and 25 or older (3.14, 3.12, and 3.02, respectively).

Table 5. Scientific Literacy by Age Range

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **453** | **3.11** | **406** | **89.6%** |
| 19 or younger | 227 | 3.14 | 209 | 92.1% |
| 20-24 | 135 | 3.12 | 118 | 87.4% |
| 25 or older | 91 | 3.02 | 79 | 86.8% |

**Award/Degree Type**

As depicted in Table 6 below, all award types met the 75% threshold of acceptability for percentage of students who met the threshold score of 2.00 – 80.0% of students seeking an Associate of Arts (AA) degree met the threshold (N=\*), 84.6% of students seeking an Associate of Applied Science (AAS) degree met the threshold (N=13), 91.8% of students seeking an Associate of Science (AS) degree met the threshold (N=281), 100.0% of students seeking a Certification (CERT) met the threshold (N=\*), and 86.2% of students seeking a Career Studies Certificate (CSC) met the threshold (N=152).

Additionally, the average score met the target score of 3.00 for AA, AS, CERT, and CSC students (3.20, 3.13, 3.88, and 3.09, respectively). AAS students met the threshold score of acceptability (2.00) with an average score of 2.73.

Table 6. Scientific Literacy by Award/Degree

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **453** | **3.11** | **406** | **89.6%** |
| Associate of Arts (AA) | \* | 3.20 | \* | 80.0% |
| Associate of Applied Science (AAS) | 13 | 2.73 | 11 | 84.6% |
| Associate of Science (AS) | 281 | 3.13 | 258 | 91.8% |
| Certification (CERT) | \* | 3.88 | \* | 100.0% |
| Career Studies Certificate (CSC) | 152 | 3.09 | 131 | 86.2% |

\* Sample size is less than ten students

## Indirect Assessment:

Method 1: Graduation Survey

**Overall**

As depicted in Table 7 below, 98.6% of graduates indicated a score of 3.00 or better regarding their satisfaction with their scientific literacy education – this met the threshold of acceptability of 85%. Additionally, with an average satisfaction score of 3.69, the target satisfaction score of 3.00 was achieved.

Table 7. Overall Scientific Literacy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **210** | **3.69** | **207** | **98.6%** |

**Gender**

As depicted in Table 8 below, all genders met the 85% threshold of acceptability for percentage of graduates who met the threshold satisfaction score of 3.00 – 98.7% of scores from female graduates met the threshold (N=159), 98.0% of scores from male graduates met the threshold (N=49), and 100.0% of the scores from graduates with an unspecified gender met the threshold (N=\*). As shown in Table 8, the average satisfaction score met the target score of 3.00 for females, males, and unspecified genders (3.71, 3.63, and 3.50, respectively).

Table 8. Scientific Literacy by Gender

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **210** | **3.69** | **207** | **98.6%** |
| Female | 159 | 3.71 | 157 | 98.7% |
| Male | 49 | 3.63 | 48 | 98.0% |
| Not Specified | \* | 3.50 | \* | 100.0% |

\* Sample size is less than ten graduates

**Race/Ethnicity**

As depicted in Table 9 below, all races met the 85% threshold of acceptability for percentage of graduates who met the threshold satisfaction score of 3.00 – 100.0% of scores from Asian graduates met the threshold (N=\*), 100.0% of scores from Black graduates met the threshold (N=30), 100.0% of the scores from Hawaiian/Pacific Islander graduates met the threshold (N=\*), 92.3% of the scores from Hispanic graduates met the threshold (N=13), 100.0% of the scores from graduates who did not specify their race met the threshold (N=\*), 100.0% of the scores from graduates who identify as two or more races met the threshold (N=\*), and 98.6% of the scores from White graduates met the threshold (N=100).

As shown in Table 9, the average satisfaction score met the target score of 3.00 for all groups – Asian (4.00), Black (3.63), Hawaiian/Pacific Islander (4.00), Hispanic (3.69), Not Specified (3.60), Two or More races (3.78) and White (3.68) graduates.

Table 9. Scientific Literacy by Race/Ethnicity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **210** | **3.69** | **207** | **98.6%** |
| Asian | \* | 4.00 | \* | 100.0% |
| Black | 30 | 3.63 | 30 | 100.0% |
| Hawaiian/Pacific Islander | \* | 4.00 | \* | 100.0% |
| Hispanic | 13 | 3.69 | 12 | 92.3% |
| Not Specified | \* | 3.60 | \* | 100.0% |
| Two or More | \* | 3.78 | \* | 100.0% |
| White | 146 | 3.68 | 144 | 98.6% |

\* Sample size is less than ten graduates

**Age Range**

As depicted in Table 10 below, all age ranges met the 85% threshold of acceptability for percentage of graduates who met the threshold satisfaction score of 3.00 – 100.0% of scores from graduates 19 or younger met the threshold (N=31), 98.0% of scores from graduates 20-24 met the threshold (N=100), and 98.7% of the scores from graduates 25 or older met the threshold (N=79). As shown in Table 10, the average satisfaction score met the target score of 3.00 for graduates 19 or younger, aged 20-24, and 25 or older (3.68, 3.64, and 3.76, respectively).

Table 10. Scientific Literacy by Age Range

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **210** | **3.69** | **207** | **98.6%** |
| 19 or younger | 31 | 3.68 | 31 | 100.0% |
| 20-24 | 100 | 3.64 | 98 | 98.0% |
| 25 or older | 79 | 3.76 | 78 | 98.7% |

\* Sample size is less than ten graduates

**Award/Degree**

As depicted in Table 11 below, all award types met the 85% threshold of acceptability for percentage of graduates who met the threshold satisfaction score of 3.00 – 85.7% of AA graduates (N=\*), 99.1% of AAS graduates (N=112), 98.3% of AS graduates (N=60), 100.0% of CERT graduates (N=\*), and 100.0% of CSC graduates (N=29) indicated satisfaction levels of 3.00 or better for scientific literacy. Additionally, the average satisfaction score met the target score of 3.00 all represented award types – AA (3.29), AAS (3.72), AS (3.62), CERT (3.50), and CSC (3.83).

Table 11. Scientific Literacy by Award/Degree Type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **210** | **3.69** | **207** | **98.6%** |
| Associate of Arts (AA) | \* | 3.29 | \* | 85.7% |
| Associate of Applied Science (AAS) | 112 | 3.72 | 111 | 99.1% |
| Associate of Science (AS) | 60 | 3.62 | 59 | 98.3% |
| Certification (CERT) | \* | 3.50 | \* | 100.0% |
| Career Studies Certificate (CSC) | 29 | 3.83 | 29 | 100.0% |

\* Sample size is less than ten graduates

Method 2: Alumni Survey

**Overall**

As depicted in Table 12 below, 97.7% of the alumni indicated a 3.00 or better regarding their satisfaction with their scientific literacy education – this met the threshold of acceptability of 85%. Additionally, with an average satisfaction score of 4.24, the target satisfaction score of 4.00 was achieved.

Table 12. Overall Scientific Literacy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |

**Gender**

As depicted in Table 13 below, all genders met the 85% threshold of acceptability for percentage of alumni who met the threshold satisfaction score of 3.00 – 96.4% of scores from female alumna met the threshold (N=83), 100.0% of scores obtained from male alumnus met the threshold (N=46), and 100.0% of alum with unspecified gender (N=\*) met the threshold satisfaction score of 3.00.

As shown in Table 13, the average satisfaction score met the target score of 4.00 for female, male, and unspecified gendered alum (4.28 and 4.15, and 5.00 respectively).

Table 13. Scientific Literacy by Gender

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |
| Female | 83 | 4.28 | 80 | 96.4% |
| Male | 46 | 4.15 | 46 | 100.0% |
| Not Specified | \* | 5.00 | \* | 100.0% |

\* Sample size is less than ten alumni

**Race/Ethnicity**

As depicted in Table 14 below, all races met the 85% threshold of acceptability for percentage of alumni who met the threshold satisfaction score of 3.00 – 100.0% of scores from Asian alumni met the threshold (N=\*), 92.9% of scores obtained from Black alumni met the threshold (N=14), 100.0% of the scores from Hispanic alumni met the threshold (N=\*), 100.0% of the scores from alumni who did not specify their race met the threshold (N=\*), 100.0% of the scores from alumni who identify as two or more races met the threshold (N=\*), and 98.0% of the scores from White alumni met the threshold (N=100).

As shown in Table 14, the average satisfaction score met the target score of 4.00 for Asian, Black, Hispanic, Two or More, and White alumni (4.50, 4.21, 4.38, 4.50, and 4.25, respectively). Alumni who did not specify race had a satisfaction score of 3.33; this meets the threshold score of acceptability (3.00).

Table 14. Scientific Literacy by Race/Ethnicity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |
| Asian | \* | 4.50 | \* | 100.0% |
| Black | 14 | 4.21 | 13 | 92.9% |
| Hispanic | \* | 4.38 | \* | 100.0% |
| Not Specified | \* | 3.33 | \* | 100.0% |
| Two or More | \* | 4.50 | \* | 100.0% |
| White | 100 | 4.25 | 98 | 98.0% |

\* Sample size is less than ten alumni

**Age Range**

As depicted in Table 15 below, all age ranges met the 85% threshold of acceptability for percentage of alumni who met the threshold satisfaction score of 3.00 – 100.0% of scores from alumni aged 19 or younger met the threshold (N=\*), 100.0% of scores obtained from alumni aged 20-24 met the threshold (N=52), and 95.8% of scores from alumni aged 25 or older met the threshold (N=71).

As shown in Table 15, the average satisfaction score met the target score of 4.00 for alumni 19 or younger, 20-24, and 25 or older (4.50, 4.23, and 4.23, respectively).

Table 15. Scientific Literacy by Age Range

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |
| 19 or younger | \* | 4.50 | \* | 100.0% |
| 20-24 | 52 | 4.23 | 52 | 100.0% |
| 25 or older | 71 | 4.23 | 68 | 95.8% |

\* Sample size is less than ten alumni

**Award/Degree**

As depicted in Table 16 below, all awards/degrees met the 85% threshold of acceptability for percentage of alumni who met the threshold satisfaction score of 3.00 – 100.0% of scores from alumni seeking an Associate of Arts (AA) degree met the threshold (N=\*), 94.1% of scores obtained alumni seeking an Associate of Applied Science (AAS) degree met the threshold (N=34), 100.0% of the scores from alumni seeking an Associate of Science (AS) degree met the threshold (N=34), 100.0% of the scores from alumni seeking a Certification (CERT) met the threshold (N=\*), and 98.1% of the scores from alumni seeking to earn a Career Studies Certificate (CSC) met the threshold (N=54).

The average satisfaction score met the target score of 4.00 for alumni seeking an AS degree, AAS degree, CERT, or CSC (4.32, 4.26, 4.20, and 4.22, respectively). The average satisfaction score for alumni seeking an AA degree met the threshold of acceptability of 3.00 with a score of 3.75.

Table 16. Scientific Literacy by Award/Degree Type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |
| Associate of Arts (AA) | \* | 3.75 | \* | 100.0% |
| Associate of Applied Science (AAS) | 34 | 4.32 | 32 | 94.1% |
| Associate of Science (AS) | 34 | 4.26 | 34 | 100.0% |
| Certification (CERT) | \* | 4.20 | \* | 100.0% |
| Career Studies Certificate (CSC) | 54 | 4.22 | 53 | 98.1% |

\* Sample size is less than ten alumni

**Graduation Status**

As depicted in Table 17 below, both graduation statuses met the 85% threshold of acceptability for percentage of students who met the threshold satisfaction score of 3.00 – 97.4% of scores from non-graduate alumnus met the threshold (N=39) and 97.8% of scores from alumnus who graduated met the threshold (N=92). As shown in Table 17, the average satisfaction score met the target score of 4.00 for alumni who did not graduate (4.00) and for those that did graduate (4.35).

Table 17. Scientific Literacy by Graduation Status

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total number of artifacts assessed (N)** | **Average Score** | **Number that met threshold (n)** | **Percent that met threshold (%)** |
| **Overall** | **131** | **4.24** | **128** | **97.7%** |
| Non-Graduates | 39 | 4.00 | 38 | 97.4% |
| Graduates | 92 | 4.35 | 90 | 97.8% |

# Comparison of Results from Last Assessment

**Have results changed since the last time this competency was assessed?**

Scientific Literacy was last assessed during the 2019-20 academic year. During that assessment cycle, 87.0% of direct assessment artifacts met the threshold of acceptability of scoring a 2.00 or better (N=150). During this assessment cycle, 89.6% of artifacts met the threshold of acceptability (N=453). Compared to 2019-20, scientific literacy scores improved by 3.0% and the sample size increased over 200%.

In 2019-20, results were not disaggregated by gender, race, age range, or award type. Therefore, these comparisons will not be able to be made until the next assessment cycle. Additionally, no indirect assessments were conducted for Scientific Literacy in 2019-20.

**What changes are we making to improve student learning for Scientific Literacy?**

One change that was made since the last assessment cycle was moving general education assessment to Canvas, VWCC’s learning management system. Having the rubric available to all instructors allows for artifacts to be collected from any course that assesses one or more scientific literacy student learning outcomes. This helped increase the number of artifacts collected by over 200% – increasing from 150 in 2019-20 to 453 in 2023-24.

The governance Assessment Committee will be presented with and review the Scientific Literacy results in Fall 2024. Recommendations will be established by the committee and presented to the Faculty Senate for approval.

# Summary

For the direct, artifact-based assessment (N=453), VWCC is meeting its threshold of acceptability of 75% of students earning a 2.00 or better (89.6%). With an average score of 3.11, this also meets the target score. This direct assessment shows that VWCC students are proficient across all aspects of the scientific literacy rubric.

For the two indirect assessments, VWCC graduates and alumni met most targets and all thresholds of acceptability. According to the 2024 Graduation Survey, 98.6% of VWCC graduates (N=210) rated their satisfaction with their scientific literacy education as 3.00 or better out of 4.00, exceeding the threshold of acceptability of 85%. Additionally, the average satisfaction score for graduates was 3.69 out of 4.00, which meets the target average satisfaction score of 3.00. Similarly, in the 2022 Alumni Survey, 97.7% of VWCC alumni (N=131) rated their satisfaction with their scientific literacy education as 3.00 or better out of 5.00, meeting the threshold of acceptability of 85%. The average satisfaction score for alumni was 4.24 out of 5.00, which meets the target average satisfaction score of 4.00.

In conclusion, while examining overall assessment results, VWCC students are proficient in their scientific literacy skills and meet all thresholds of acceptability. This report will be shared with the governance Assessment Committee for feedback and next steps.

# Appendix A – Scientific Literacy Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scientific Literacy Rubric** | | | | |
|  | **Excellent-4** | **Good-3** | **Acceptable-2** | **Needs Improvement-1** |
| **Formulate a hypothesis** | Formulates a testable hypothesis related to the problem. | Hypothesis is established but is not testable OR is unrelated to the problem. | Hypothesis is established but is not testable AND is unrelated to the problem. | Hypothesis is missing. |
| **Collect data** | Relevant data is collected with few or no errors. | Relevant data is collected with minor errors. | Relevant data is collected with a significant number of errors. | No relevant data is collected. |
| **Analyze data** | Data is analyzed with few or no errors. | Data is analyzed with minor errors. | Data is analyzed with a significant number of errors. | Data is not analyzed. |
| **Draw accurate conclusions based on data** | Conclusion drawn fully supports the scientific argument. | Conclusion drawn partially supports the scientific argument. | Conclusion drawn does not support the scientific argument. | Conclusion is missing. |

# Appendix B – Graduation and Alumni Survey Examples

Image 1. Graduation Survey Scientific Literacy Satisfaction Question

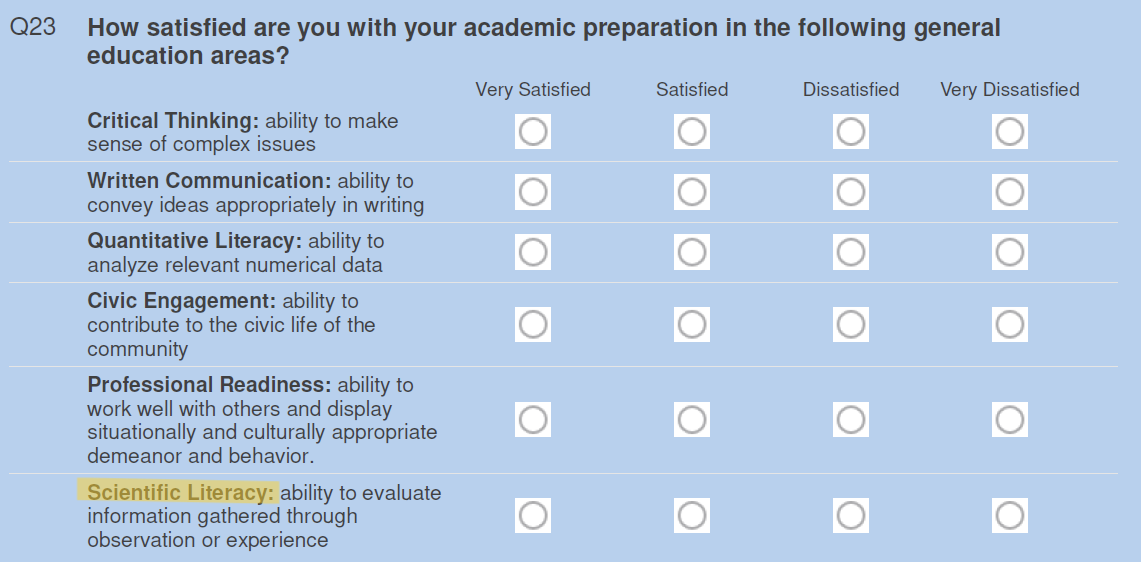


Image 2. Alumni Survey Scientific Literacy Satisfaction Question

