# General Education Assessment of Arts & Humanities and Mathematics (Spring 2016)

## History of the Assessment Program

Assessment of student learning outcomes is a national expectation in higher education, and the expectation calls for increased accountability. Section 2.7.3 of the Southern Association of Colleges and Schools' (SACS) accreditation standards requires in each undergraduate program the successful completion of a general education component that:

1) is a substantial component of each undergraduate degree,
2) ensures breadth of knowledge, and
3) is based on a coherent rationale.

Section 3.5.1 of the SACS accreditation standards also requires that "the institution identifies college-level competencies within the general education core and provides evidence that graduates have attained those competencies."

Based on these standards, in 2005, the Provost charged the General Education Curriculum Committee (GECC) with developing and implementing an assessment program. To accomplish this directive, the committee developed and modified rubrics to measure student performance in the competencies stated in the preamble of the General Education Plan: "The General Education Program at the University of Louisville fosters active learning by asking students to:

1) think critically,
2) to communicate effectively, and
3) understand and appreciate cultural diversity."

The GECC initiated the first General Education Assessment in fall of 2005. The university adopted LiveText© as the platform for electronic assessment of General Education artifacts in the fall of 2010. The assessment is currently in the third cycle, which is scheduled to be complete in May 2016. This report summarizes the process, results, and findings for the assessment of student performance in General Education Arts & Humanities (A&H) and Mathematics (M) courses for the fall 2015 semester.

## Assessment Administration

The General Education Program at the University of Louisville advances three over-arching competencies: critical thinking, effective communication, and cultural diversity. In addition, the university has defined additional learning outcomes for the following content areas: Arts and Humanities, Mathematics, Natural Sciences, Oral Communication, Social and Behavioral Sciences, and Written Communication. The University of Louisville Student Learning Outcomes are closely aligned with the Statewide General Education Student Learning Outcomes. A crosswalk of the outcomes and assessment measures is provided in Appendix A.

**University of Louisville Arts and Humanities Learning Outcomes**

Arts and Humanities are concerned with understanding texts of art, music, theatre, literature, philosophy, and religious thought. Students who satisfy this requirement will demonstrate that they are able to do all of the following:

1. Communicate an understanding of vocabulary, concepts, materials, techniques, and methods of intellectual inquiry within the arts and/or humanities;
2. Describe and evaluate texts using primary and secondary materials;
3. Analyze and synthesize texts, recognizing the diversity of cultures and historical contexts.

**Statewide Arts and Humanities Student Learning Outcomes**

1. Utilize basic formal elements, techniques, concepts and vocabulary of specific disciplines within the Arts and Humanities.
2. Distinguish between various kinds of evidence by identifying reliable sources and valid arguments.
3. Demonstrate how social, cultural, and historical contexts influence creative expression in the arts and humanities.
4. Evaluate the significance of human expression and experience in shaping larger social, cultural, and historical contexts.
5. Evaluate enduring and contemporary issues of human experience.

**University of Louisville General Education Rubric Measures**

*Effective Communication (EC) Rubric*

1. Writer articulates clear purpose and employs tone consistent with purpose and audience.
2. Writer employs clear and coherent organization.
3. Writer demonstrates analysis or synthesis.
4. Writer uses appropriate conventions and style.

*Critical Thinking (CT) Rubric*

1. Claim – States thesis; Identifies purpose; Demonstrates recognition of problem or question.
2. Evidence – Uses evidence, information, data, observations, experiences, and/or reasons.
3. Inference – Makes a logical argument; Develops a line of reasoning based on evidence.
4. Influence of Context and Assumptions.
5. Implications – Evaluates implications, conclusions, and consequences.

*Cultural Diversity (CD) Rubric*

1. Writer recognizes ways that culture shapes behavior and attitudes.
2. Writer demonstrates ability to understand the relationship of culture to its environment and history.
3. Writer recognizes that cultural groups are internally diverse.
4. Writer brings awareness of cultural diversity to the analysis of problems or issues.

**University of Louisville Mathematics Learning Outcomes**

Mathematics is concerned with solving real-world problems through mathematical methods. Students who satisfy this requirement will demonstrate that they are able to do all of the following:

1. Represent mathematical information symbolically, visually, and numerically;
2. Use arithmetic, algebraic, and geometric models to solve problems;
3. Interpret mathematical models, such as formulas, graphs, and tables;
4. Estimate and check answers to mathematical problems, determining reasonableness; alternatives; and correctness and completeness of solutions.

**Statewide Quantitative Reasoning Student Learning Outcomes**

1. Interpret information presented in mathematical and/or statistical forms.
2. Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically.
3. Determine when computations are needed and to execute the appropriate computations.
4. Apply an appropriate model to the problem to be solved.
5. Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analyses.

**University of Louisville General Education Mathematics Rubric Measures**

*Critical Thinking Rubric for Mathematics*

1. Correctly interprets mathematical information
2. Applies mathematical models to solve problems
3. Represents mathematical information
4. Provides complete, reasonable, and correct answers

The University of Louisville General Education Rubrics use a four-point scale, with *4* indicating performance of the measure as "clearly evident," *3* indicating performance as "usually evident," *2* indicating "minimally evident," and *1* indicating performance as "not evident." In addition, a score of "not requested" could be assigned for assignments that did not provide an opportunity for the student to demonstrate the criterion within the rubric measure.

**Assessment Process**

For the spring 2016 assessment of student work from the Arts & Humanities and Mathematics content areas, the Office of General Education Assessment notified department chairs of the upcoming assessment and met with them to provide an overview of the project, the outcomes to be assessed, and sampling process. A formal memo outlining the project and process was also provided to each of the department chairs and to all faculty teaching General Education courses within these two content areas prior to the start of the semester to ensure a mutual understanding of project expectations. The initial communication provided a timeline for collection of syllabi, assignment prompts, and student work.

After the semester withdrawal deadline passed, the Office of General Education Assessment requested the class rosters for all General Education courses in Arts & Humanities and Mathematics from the Office of the Register and systematically selected every fifth student for assessment from the roster. Instructors of all General Education courses in Arts & Humanities and Mathematics were sent assessment rosters along with detailed instructions requesting that instructors provide a copy of one assignment along with the ungraded responses for the selected students to be sent via email to the Assessment Coordinator.

Student artifacts were collected and stored in an electronic repository and uploaded into the LiveText© assessment management system. A panel of faculty (tenured and tenure-track faculty, term faculty, and adjunct faculty) and graduate teaching assistants assessed student artifacts. For the Arts & Humanities assessment, the assessors applied the university's Effective Communication, Critical Thinking, and Cultural Diversity rubrics and for Mathematics the university's Critical Thinking Rubric for Mathematics was applied. Prior to the assessment reading, assessors were brought together for a five-hour training session coordinated by the Office of General Education Assessment. In the training sessions, the assessment process and context for General Education Assessment at the University of Louisville were presented. Faculty engaged in dissection and discussion of rubric criteria, and faculty assessors individually reviewed and scored benchmark sample assignments. Benchmarks were assignments selected to represent a wide range of content and skill development in order to give the assessors a baseline for measuring expectations of learning and evaluating student performance (Herman, Osmundson, & Dietel, 2010). Assessors then engaged in discussion about the benchmark assessment scores to share their rationales for why particular scores were selected. To highlight the reliability of the training scoring, the results from scoring benchmark samples for the Effective Communication Rubric are provided in Table 1 and Figure 1, Critical Thinking Rubric in Table 2 and Figure 2, Cultural Diversity Rubric in Table 3 and Figure 3, and Mathematics Rubric in Table 4 and Figure 4.

Contents of Table 1 and Figure 1

*Detailed results of Benchmark Sample 1 for Effective Communication (Table 1)*
*EC1: The majority of readers scored the first sample artifact for measure EC1 at either "Clearly Evident" or "Usually Evident". 31.8% of readers scored the artifact at "Clearly Evident", 54.5% at "Usually Evident", 9.1% at "Minimally Evident", and 4.5% at "Not Evident".*

*EC2: Measure EC2 was primarily at the "Usually Evident" level with 81.8% of readers selecting "Usually Evident". 9.1% of readers scored the benchmark sample at "Clearly Evident" and 9.1% at "Minimally Evident".*

*EC3: 32.0% of readers scored the benchmark at "Usually Evident", 64.0% at "Minimally Evident", and 4.0% at "Not Evident" for measure EC3.*

*EC4: 30.4% of readers scored the benchmark at "Clearly Evident", 56.5% at "Usually Evident", 4.3% at "Minimally Evident", and 8.7% at "Not Evident".*

*Detailed Results of Benchmark Sample 2 for Effective Communication (Table 1)*
*EC1: 29.4% of readers scored the second benchmark sample at "Clearly Evident", 41.2% at "Usually Evident", and 29.4% at "Minimally Evident".*

*EC2: 4.8% of readers scored the sample at "Clearly Evident", 47.6% at "Usually Evident", and 29.4% at "Minimally Evident".*

*EC3: 45.0% of readers scored the sample at "Usually Evident" and 55.0% at "Minimally Evident".*

*EC4: 28.6% of readers scored the sample at "Clearly Evident", 47.6% at "Usually Evident", and 23.8% at "Minimally Evident".*

Contents of Table 2 and Figure 2

*Detailed Results of Benchmark Sample 1 for Critical Thinking (Table 2)*
*CT1: Measure CT1 was primarily scored at the "Minimally Evident" level at 75.0%. 4.2% of readers scored the sample at "Usually Evident" and 20.8% scored it at "Not Evident".*

*CT2: 20.8% of readers scored sample 1 at "Usually Evident", 66.7% scored it at "Minimally Evident", and 12.5% at "Not Evident".*

*CT3: 50.0% of readers scored the first sample at "Usually Evident", 45.5% scored it at "Minimally Evident", and 4.5% at "Not Evident".*

*CT4: 31.8% of readers scored sample 1 at "Usually Evident", 63.6% at "Minimally Evident", and 4.5% at "Not Evident".*

*CT5: 31.8% of readers scored sample 1 at "Usually Evident", 63.6% at "Minimally Evident", and 4.5% at "Not Evident".*

*Detailed Results of Benchmark Sample 2 for Critical Thinking (Table 2)*
*CT1: 20.0% of readers scored sample 2 at "Clearly Evident", 73.3% at "Usually Evident", and 6.7% at "Minimally Evident".*

*CT2: 10.0% of readers scored sample 2 at "Clearly Evident", 40.0% at "Usually Evident", 50.0% at "Minimally Evident". One reader selected the "Not Requested" rating for Sample 2.*

*CT3: 57.9% of readers scored sample 2 at "Usually Evident" and 42.1% at "Minimally Evident".*

*CT4: 15.4% of readers scored sample 2 at "Usually Evident", 76.9% at "Minimally Evident" and 7.7% at "Not Evident". Six readers also selected the "Not Requested" rating for Sample 2.*

*CT5: 31.6% of readers scored sample 2 at "Usually Evident", 57.9% at "Minimally Evident", and 10.5% at "Not Evident". One reader selected "Not Requested" for Sample 2.*

Contents of Table 3 and Figure 3

*Detailed Results of Benchmark Sample 1 for Cultural Diversity (Table 3)*
*CD1: 45.0% of readers scored sample 1 at "Usually Evident", 45.0% at "Minimally Evident", and 10.0% at "Not Evident".*

*CD2: 90.5% of readers scored sample 1 at "Minimally Evident" and 9.5% at "Not Evident".*

*CD3: 4.5% of readers scored sample 1 at "Usually Evident", 72.7% at "Minimally Evident", and 22.7% at "Not Evident".*

*CD4: 71.4% of readers scored sample 1 at "Minimally Evident" and 28.6% at "Not Evident". Three readers selected the "Not Requested" rating for CD4.*

*Detailed Results of Benchmark Sample 2 for Cultural Diversity (Table 3)*
*CD1: 14.3% of readers scored sample 2 at "Usually Evident" and 85.7% at "Not Evident". 14 readers selected "Not Requested".*

*CD2: 41.7% of readers scored sample 2 at "Minimally Evident" and 58.3% at "Not Evident". Nine readers selected "Not Requested".*

*CD3: 100.0% of readers scored sample 2 at "Not Evident". 18 readers selected "Not Requested".*

*CD4: All readers selected "Not Requested" for CD4.*

Contents of Table 4 and Figure 4

*Detailed Results of Benchmark Sample 1 for Mathematics (Table 4)*
*M1: 61.1% of readers scored sample 1 at "Clearly Evident" and 38.9% scored it at "Usually Evident".*

*M2: 94.4% of readers scored sample 1 at "Clearly Evident" and 5.6% scored it at "Usually Evident".*

*M3: 83.3% of readers scored sample 1 at "Clearly Evident" and 16.7% at "Usually Evident".*

*M4: 50.0% of readers scored sample 1 at "Clearly Evident" and 50.0% at "Usually Evident".*

*Detailed Results of Benchmark Sample 2 for Mathematics (Table 4)*
*M1: 88.2% of readers scored sample 2 at "Clearly Evident" and 11.8% at "Usually Evident".*

*M2: 83.3% of readers scored sample 2 at "Clearly Evident" and 16.7% at "Usually Evident".*

*M3: 41.2% of readers scored sample 2 at "Clearly Evident" and 58.8% at "Usually Evident".*

*M4: 5.6% of readers scored sample 2 at "Clearly Evident", 83.3% at "Usually Evident", and 11.1% at "Minimally Evident".*

*Detailed Results of Benchmark Sample 3 for Mathematics (Table 4)*
*M1: 36.8% of readers scored sample 3 at "Clearly Evident", 57.9% at "Usually Evident", and 5.3% at "Minimally Evident".*

*M2: 57.9% of readers scored sample 3 at "Cleary Evident", 36.8% at "Usually Evident", and 5.3% at "Minimally Evident".*

*M3: 11.1% of readers scored sample 3 at "Clearly Evident", 72.2% at "Usually Evident", and 16.7% at "Minimally Evident".*

*M4: 42.1% of readers scored sample 3 at "Clearly Evident", 47.4% at "Usually Evident", and 10.5% at "Minimally Evident".*

*Detailed Results of Benchmark Sample 4 for Mathematics (Table 4)*
*M1: 100.0% of readers scored sample 4 at "Clearly Evident".*

*M2: 94.4% of readers scored sample 4 at "Clearly Evident" and 5.6% at "Usually Evident".*

*M3: 88.9% of readers scored sample 4 at "Clearly Evident" and 11.1% at "Usually Evident".*

*M4: 61.1% of readers scored sample 4 at "Clearly Evident" and 38.9% at "Usually Evident".*

Faculty assessors received training on the LiveText© assessment management system prior to reviewing student artifacts. Each faculty assessor was assigned a username and password for one of three LiveText© accounts and a list of courses and sections to assess. Three faculty readers assessed each artifact so that scores could be compared across assessors for reliability purposes.

**Data Collection Overview**

As of the fall final withdrawal date, 3692 students were enrolled in Arts & Humanities General Education courses and 2465 students were enrolled in Mathematics General Education courses. A total of 254 student artifacts (6.8%) were received and determined to be eligible for review for Arts & Humanities and 294 student artifacts (11.9%) for Mathematics. Table 5 presents the number of assessable artifacts received by department and interdisciplinary degree program within the Arts & Humanities and Table 6 presents the number of assessable artifacts received for the Mathematics assessment from Engineering and Mathematics.

Contents of Table 5: Sample from Arts & Humanities
Asian Studies included AST 290 - Survey of Asian Art (1 course section, 1 artifact)

Classical and Modern Languages included M L 250 – Introduction to the Francophone World (1 course section, 2 artifacts)

Education (Teacher Preparation) included EDTP 245 – Children's Literature (1 course section, 3 artifacts)
English included ENGL 250 – Introduction to Literature (1 course section, 2 artifacts)

Fine Arts included ARTH 203 – Introduction to Art (2 course sections, 9 artifacts), ARTH 250 – Ancient to Medieval Art (4 course sections, 15 artifacts), ARTH 270 – Renaissance Through Modern Art (4 course sections, 11 artifacts), and ARTH 290 – Survey of Asian Art (1 course section, 5 artifacts)

Humanities included HUM 101 – World Literature to 1700 (2 course sections, 7 artifacts), HUM 102 – World Literature after 1700 (2 course sections, 4 artifacts), HUM 151 – Creativity & the Arts (5 course sections, 24 artifacts), HUM 152 – Cultures of America (9 course sections, 47 artifacts), HUM 215 – Introduction to the Study of Religion (1 course section, 5 artifacts), HUM 216 – Introduction to World Religions (4 course sections, 20 artifacts), HUM 218 – Introduction to Eastern Religious Traditions (2 course sections, 5 artifacts), HUM 219 – Introduction to Western World Religions (1 course section, 3 artifacts), and HUM 224 – Introduction to Film (2 course sections, 5 artifacts)

Latin American and Latino Studies included LALS 200 – Exploring Latin America (1 course section, 1 artifact)

Mathematics included MATH 152 – Math for Elementary Education II (1 course section, 2 artifacts)

Music History included MUH 204 – Music in Western Civilization (8 course sections, 25 artifacts), MUH 212 – History of Rock & Roll (1 course section, 8 artifacts), MUH 214 – African American Music (1 course section, 3 artifacts), and MUH 218 – Survey of American Jazz (1 course section, 7 artifacts)

Pan-African Studies included PAS 214 – African American Music (1 course section, 5 artifacts), PAS 218 – Survey of American Jazz (1 course section, 5 artifacts), and PAS 273 – Rhythm and Blue Revolution (1 course section, 4 artifacts)

Philosophy included PHIL 205 – Introduction to Philosophy (4 course sections, 18 artifacts), PHIL 206 – Introduction to Philosophy through Literature and Film (1 course section, 4 artifacts), and PHIL 211 – Critical Thinking (1 course section, 4 artifacts)

Contents of Table 6: Sample from Mathematics
ENGR 101 – Engineering Analysis I (13 course sections, 63 artifacts)
ENGR 190 – Introductory Calculus (6 course sections, 20 artifacts)
MATH 105 – Contemporary Mathematics (13 course sections, 41 artifacts)
MATH 111 – College Algebra (24 course sections, 85 artifacts)
MATH 112 – Trigonometry (1 course section, 5 artifacts)

MATH 152 – Math for Elementary Education II (2 course sections, 9 artifacts)
MATH 180 – Elements of Calculus (5 course sections, 14 artifacts)
MATH 190 – Precalculus (9 course sections, 26 artifacts)
MATH 205 – Calculus I (9 course sections, 29 artifacts)
MATH 206 – Calculus II (2 course sections, 2 artifacts)

**Summary of Assessment Data**

*Arts & Humanities*
For the assessment of Arts & Humanities outcomes, 254 student artifacts were assessed by faculty and graduate teaching assistants from the College of Arts & Sciences, College of Business, School of Dentistry, College of Education and Human Development, Kent School of Social Work, and the School of Music, using the Effective Communication, Critical Thinking, and Cultural Diversity rubrics. A summary of results from the A&H assessment is provided in Table 7 and Figure 5.

The criterion for both the Effective Communication and the Critical Thinking rubrics was set by the General Education Assessment Coordinator and the General Education Curriculum Committee Assessment Subcommittee at 60% of artifacts to score at a *3* or *4*, indicating that at least 60% demonstrate performance at either the "usually evident" or "clearly evident" level. The criterion was met for EC1, EC2, EC4, CT1, CT2, and CT3 and was not met for EC3, CT4, and CT5.

The criterion for the Cultural Diversity Rubric was set by the General Education Assessment Coordinator and the General Education Curriculum Committee Assessment Subcommittee at 40% of artifacts to score at a *3* or *4*, indicating that at least 40% would perform at either the "usually evident" or "clearly evident" level. The criterion was met for all CD measures except for CD4.

Contents of Table 7 and Figure 5
*Effective Communication Measures (EC1-EC4)*
*EC1: 41.9% of artifacts were scored at "Clearly Evident", 34.9% at "Usually Evident", 19.4% at "Minimally Evident", and 3.8% at "Not Evident". 8 artifacts were scored as "Not Requested". 76.8% of artifacts scored at a 3 or 4.*

*EC2: 30.8% of artifacts were scored at "Clearly Evident", 37.8% at "Usually Evident", 26.1% at "Minimally Evident", and 5.3% at "Not Evident". 3 artifacts were scored as "Not Requested". 68.6% of artifacts scored at a 3 or 4.*

*EC3: 19.0% of artifacts were scored at "Clearly Evident", 33.4% at "Usually Evident", 39.7% at "Minimally Evident", and 7.9% at "Not Evident". 11 artifacts were scored as "Not Requested". 52.5% of artifacts scored at a 3 or 4.*

*EC4: 32.4% of artifacts were scored at "Clearly Evident", 47.6% at "Usually Evident", 15.4% at "Minimally Evident", and 4.6% at "Not Evident". 3 artifacts were scored as "Not Requested". 80.0% of artifacts scored at a 3 or 4.*

*Critical Thinking Measures (CT1-CT5)*
*CT1: 37.6% of artifacts were scored at "Clearly Evident", 36.8% at "Usually Evident", 19.4% at "Minimally Evident", 6.2% at "Not Evident". 18 artifacts were scored as "Not Requested". 74.5% of artifacts scored at a 3 or 4.*

*CT2: 20.9% of artifacts were scored at "Cleary Evident", 42.0% at "Usually Evident", 30.6% at "Minimally Evident", and 6.5% at "Not Evident". 7 artifacts were scored as "Not Requested". 62.9% of artifacts scored at a 3 or 4.*

*CT3: 17.9% of artifacts were scored at "Clearly Evident", 60.9% at "Usually Evident", 16.3% at "Minimally Evident", 4.9% at "Not Evident". 8 artifacts were scored as "Not Requested". 78.8% of artifacts scored at a 3 or 4.*

*CT4: 14.8% of artifacts were scored at "Clearly Evident", 31.2% at "Usually Evident", 37.4% at "Minimally Evident", and 16,5% at "Not Evident". 41 artifacts were scored as "Not Requested". 46.0% of artifacts scored at a 3 or 4.*

*CT5: 15.1% of artifacts were scored at "Clearly Evident", 39.7% at "Usually Evident", 33.3% at "Minimally Evident", and 11.8% at "Not Evident". 41 artifacts were scored as "Not Requested". 54.8% of artifacts scored at a 3 or 4.*

*CD1: 18.1% of artifacts were scored at "Clearly Evident", 38.3% at "Usually Evident", 28.0% at "Minimally Evident", and 15.5% at "Not Evident". 170 artifacts were scored as "Not Requested". 56.4% of artifacts scored at a 3 or 4.*

*CD2: 18.5% of artifacts were scored at "Clearly Evident", 25.7% at "Usually Evident", 36.2% at "Minimally Evident", and 19.6% at "Not Evident". 201 artifacts were scored as "Not Requested". 44.2% of artifacts scored at a 3 or 4.*

*CD3: 15.6% of artifacts were scored at "Clearly Evident", 25.9% at "Usually Evident", 33.9% at "Minimally Evident", and 24.6% at "Not Evident". 275 artifacts were scored as "Not Requested". 41.5% of artifacts scored at a 3 or 4.*

*CD4: 14.8% of artifacts were scored at "Clearly Evident", 23.5% at "Usually Evident", 38.7% at "Minimally Evident", and 23.0% at "Not Evident". 276 artifacts were scored as "Not Requested". 38.3% of artifacts scored at a 3 or 4.*

The "not requested" scores were excluded from calculation of the percentage of overall ratings (Table 7), and mean and mode (Table 8). A count of "not requested" is provided in Table 7. The mean and mode for each rubric measure is provided in Table 8 and Figures 6 and 7.

Contents of Table 8, Figure 6, and Figure 7

*Mean Scores for Effective Communication Measures:*
*EC1 = 3.15*
*EC2 = 2.94*
*EC3 = 2.64*
*EC4 = 3.08*

*Mode for Effective Communication Measures:*
*EC1 = 4*
*EC2 = 3*
*EC3 = 2*
*EC4 = 3*

*Mean Scores for Critical Thinking Measures:*
*CT1 = 3.06*
*CT2 = 2.78*
*CT3 = 2.92*
*CT4 = 2.45*
*CT5 = 2.58*

*Mode for Critical Thinking Measures:*
*CT1 = 4*
*CT2 = 3*
*CT3 = 3*
*CT4 = 2*
*CT5 = 3*

*Mean Scores for Cultural Diversity Measures:*
*CD1 = 2.59*
*CD2 = 2.43*
*CD3 = 2.32*
*CD4 = 2.30*

*Mode for Cultural Diversity Measures:*
*CD1 = 3*
*CD2 = 2*
*CD3 = 2*
*CD4 = 2*

*Mathematics*

For the assessment of Mathematics outcomes, 294 student artifacts were assessed by faculty and graduate teaching assistants from the College of Arts & Sciences, the J. B. Speed School of Engineering, and the College of Education and Human Development, using the Mathematics Critical Thinking Rubric. A summary of results from the Mathematics assessment is provided in Table 9 and Figure 8.

The criterion for both the Mathematics Rubric was set by the General Education Assessment Coordinator and the General Education Curriculum Committee Assessment Subcommittee at 60% of artifacts to score at a *3* or *4*, indicating that at least 60% demonstrate performance at either the "usually evident" or "clearly evident" level. The criterion was met for all measures.

Contents of Table 9 and Figure 8

*Mathematics Measures*

*M1: 60.0% of artifacts were scored at "Clearly Evident", 17.3% at "Usually Evident", 15.9% at "Minimally Evident", and 6.8% at "Not Evident". 77.3% of artifacts scored at a 3 or 4.*

*M2: 49.0% of artifacts were scored at "Clearly Evident", 24.5% at "Usually Evident", 17.5% at "Minimally Evident", and 9.1% at "Not Evident". 73.5% of artifacts scored at a 3 or 4.*

*M3: 43.0% of artifacts were scored at "Clearly Evident", 30.4% at "Usually Evident", 18.1% at "Minimally Evident", and 8.5% at "Not Evident". 73.4% of artifacts scored at a 3 or 4.*

*M4: 41.5% of artifacts were scored at "Clearly Evident", 25.2% at "Usually Evident", 21.5% at "Minimally Evident", and 11.8% at "Not Evident". 66.7% of artifacts scored at a 3 or 4.*

The mean and mode for each rubric measure are provided in Table 10. Figure 9 represents the mean scores by measure. The mean score was highest for M1 (3.3) and lowest for M4 (2.96)

Contents of Table 10 and Figure 9

*Mean Scores for Mathematics Measures*
*M1 = 3.30*
*M2 = 3.13*
*M3 = 3.08*
*M4 = 2.96*

*Mode for Mathematics Measures*
*M1 = 4*

*M2 = 4*
*M3 = 4*
*M4 = 4*

**Inter-rater Reliability**

Three separate readers assessed each student artifact. Table 11 displays the mean score for the three separate readings of all artifacts.

Contents of Table 11

*Effective Communication*
*EC1: Assessor 1 mean was 3.05, Assessor 2 mean was 3.18, Assessor 3 mean was 3.21 , with a Standard Deviation of 0.09*
*EC2: Assessor 1 mean was 2.87, Assessor 2 mean was 2.95, Assessor 3 mean was 3.01 , with a Standard Deviation of 0.07*
*EC3: Assessor 1 mean was 2.62, Assessor 2 mean was 2.61, Assessor 3 mean was 2.68, with a Standard Deviation of 0.04*
*EC4: Assessor 1 mean was 3.06, Assessor 2 mean was 3.13, Assessor 3 mean was 3.04, with a Standard Deviation of 0.04*

*Critical Thinking*
*CT1: Assessor 1 mean was 3, Assessor 2 mean was 3.08, Assessor 3 mean was 3.1, with a Standard Deviation of 0.06*
*CT2: Assessor 1 mean was 2.72, Assessor 2 mean was 2.79, Assessor 3 mean was 2.81, with a Standard Deviation of 0.05*
*CT3: Assessor 1 mean was 2.84, Assessor 2 mean was 2.98, Assessor 3 mean was 2.93, with a Standard Deviation of 0.07*
*CT4: Assessor 1 mean was 2.41, Assessor 2 mean was 2.47, Assessor 3 mean was 2.45, with a Standard Deviation of 0.03*
*CT5: Assessor 1 mean was 2.59, Assessor 2 mean was 2.67, Assessor 3 mean was 2.47, with a Standard Deviation of 0.1*

*Cultural Diversity*
*CD1: Assessor 1 mean was 2.52, Assessor 2 mean was 2.6, Assessor 3 mean was 2.66, with a Standard Deviation of 0.07*
*CD2: Assessor 1 mean was 2.24, Assessor 2 mean was 2.43, Assessor 3 mean was 2.65, with a Standard Deviation of 0.2*
*CD3: Assessor 1 mean was 2.12, Assessor 2 mean was 2.35, Assessor 3 mean was 2.52, with a Standard Deviation of 0.2*
*CD4: Assessor 1 mean was 2.22, Assessor 2 mean was 2.24, Assessor 3 mean was 2.46, with a Standard Deviation of 0.13*

*Mathematics*
*M1: Assessor 1 mean was 3.35, Assessor 2 mean was 3.38, Assessor 3 mean was 3.18, with a Standard Deviation of 0.11*

*M2: Assessor 1 mean was 3.2, Assessor 2 mean was 3.2, Assessor 3 mean was 3, with a Standard Deviation of 0.12*
*M3: Assessor 1 mean was 3.12, Assessor 2 mean was 3.13, Assessor 3 mean was 2.99, with a Standard Deviation of 0.08*
*M4: Assessor 1 mean was 3.06, Assessor 2 mean was 3.06, Assessor 3 mean was 2.77, with a Standard Deviation of 0.17*

In addition to the descriptive statistics, Table 12 provides multiple measures of inter-rater reliability. The percentage agreement value was calculated to determine the percentage of artifacts for which all three assessors scored at the same performance level or within one level. Values for *Total Agreement* provided in Table 12 represent the percentage of artifacts for which all three assessors selected the same score (e.g., Assessors 1, 2, and 3 all selected *3*). *Agreement (within 1 level)* represents the percentage of artifacts for which all three assessors scored the artifact at the same performance level or within one level (e.g., Assessor 1 selected a score of *3*, Assessor 2 selected a score of *2*, and Assessor 3 also selected a score of *2*).

In addition to percentage agreement, a one-way, average-measures intra-class correlation coefficient (ICC) was calculated to assess inter-rater reliability. ICC coefficients between .75 and 1.00 are considered excellent, .60 to .74 considered good, .40 to .59 fair, and below .4 is considered poor (Cicchetti, 1994). Based upon these criteria, inter-rater reliability was within the excellent range for all Mathematics Rubric measures. The Cultural Diversity and Effective Communication measures were all within the acceptable ranges. The Critical Thinking measures were fair, with CT4 and CT5 falling into the poor range.

Contents of Table 12

*Effective Communication Measures*
*EC1: 19.3% of artifacts were scored at the same performance level and 69.3% of artifacts were scored within one performance level. The ICC was 0.47 with a 95% Confidence Interval of (.35-.58).*
*EC2: 14.6% of artifacts were scored at the same performance level and 68.5% of artifacts were scored within one performance level. The ICC was 0.45 with a 95% Confidence Interval of (.32-.56).*
*EC3: 15.4% of artifacts were scored at the same performance level and 69.3% of artifacts were scored within one performance level. The ICC was 0.53 with a 95% Confidence Interval of (.42-.62).*
*EC4: 17.3% of artifacts were scored at the same performance level and 76.0% of artifacts were scored within one performance level. The ICC was 0.46 with a 95% Confidence Interval of (.33-.56).*

*Critical Thinking Measures*
*CT1: 14.6% of artifacts were scored at the same performance level and 61.0% of artifacts were scored within one performance level. The ICC was 0.44 with a 95% Confidence Interval of (.31-.55).*
*CT2: 16.1% of artifacts were scored at the same performance level and 70.9% of artifacts were*

*scored within one performance level. The ICC was 0.47 with a 95% Confidence Interval of (.34-.57).*
*CT3: 29.1% of artifacts were scored at the same performance level and 78.3% of artifacts were scored within one performance level. The ICC was 0.41 with a 95% Confidence Interval of (.28-.53).*
*CT4: 11.8% of artifacts were scored at the same performance level and 53.5% of artifacts were scored within one performance level. The ICC was 0.34 with a 95% Confidence Interval of (.19-.47).*
*CT5: 13.0% of artifacts were scored at the same performance level and 59.1% of artifacts were scored within one performance level. The ICC was 0.37 with a 95% Confidence Interval of (.22-.49).*

*Cultural Diversity Measures*
*CD1: 16.9% of artifacts were scored at the same performance level and 54.7% of artifacts were scored within one performance level. The ICC was 0.6 with a 95% Confidence Interval of (.51-.68).*
*CD2: 21.3% of artifacts were scored at the same performance level and 57.9% of artifacts were scored within one performance level. The ICC was 0.59 with a 95% Confidence Interval of (.50-.67).*
*CD3: 31.9% of artifacts were scored at the same performance level and 62.2% of artifacts were scored within one performance level. The ICC was 0.62 with a 95% Confidence Interval of (.53-.69).*
*CD4: 30.7% of artifacts were scored at the same performance level and 67.3% of artifacts were scored within one performance level. The ICC was 0.66 with a 95% Confidence Interval of (.58-.72).*

*Mathematics Measures*
*M1: 50.0% of artifacts were scored at the same performance level and 84.4% of artifacts were scored within one performance level. The ICC was 0.86 with a 95% Confidence Interval of (.83-.89).*
*M2: 38.4% of artifacts were scored at the same performance level and 85.4% of artifacts were scored within one performance level. The ICC was 0.86 with a 95% Confidence Interval of (.83-.89).*
*M3: 26.2% of artifacts were scored at the same performance level and 84.7% of artifacts were scored within one performance level. The ICC was 0.81 with a 95% Confidence Interval of (.77-.84).*
*M4: 37.1% of artifacts were scored at the same performance level and 87.8% of artifacts were scored within one performance level. The ICC was 0.88 with a 95% Confidence Interval of (.85-.90).*

## Lessons Learned

*Arts & Humanities*
Results from the application of the Effective Communication, Critical Thinking, and Cultural Diversity rubrics are consistent with previous assessments from across the General Education

Curriculum. For effective communication, students continue to excel at stating a clear purpose, employing coherent organization, and using appropriate conventions and style, while not demonstrating analysis and synthesis at the same level. With the critical thinking measures, students continue to excel at stating their thesis, providing evidence, and making an argument, however they do not demonstrate a strong understanding of the influence of context and assumptions or the implications related to the assignment topic. Further, there continues to be a high volume of assignments scored as "not requested" on the Cultural Diversity rubric. This indicates that the general education curriculum and specifically assignments selected for assessment are not aligned with the measures outlined in the Cultural Diversity Rubric.

Feedback from assessment readers also suggested a continued struggle with student work that is in a question and answer format instead of an essay or paper format. Assignments of this type do not allow for the depth of critical thinking and organized writing requested in both the Critical Thinking and Effective Communication rubrics.

*Mathematics*

The major take-away from the Mathematics assessment was that assessors would like to have copies of the answer keys when scoring student artifacts. While the assessors had the content knowledge to determine the correctness of responses, which is scored in rubric measure four of the Mathematics Rubric, they were forced to spend time calculating responses to each problem set that they assessed.

*Assessment Instrumentation*

The university is currently undergoing a General Education program revision. With a pending revision to the program and the assessment of student learning outcomes within the program, the GECC has determined that no further revisions will be made to the existing assessment instruments. The Office of General Education Assessment will continue to capture feedback on the assessment instruments to help guide the development of new instruments when the new General Education program goes into effect.

**Measures and Targets**

For the assessment of Arts & Humanities and Mathematics, a target was set at 60% of students demonstrating the outcomes at the "clearly evident" or "usually evident" level for the Critical Thinking, Effective Communication, and Mathematics Rubrics and 40% for the Cultural Diversity Rubric. While the target was met for some of the rubric measures, not all were met. The GECC Assessment Committee has set the current goal of 60% and 40% as a short-term goal for the upcoming assessment of the Social & Behavioral Science content area and Cultural Diversity competency area, with the expectation to exceed these targets on all measures and increase the targets for future assessments.

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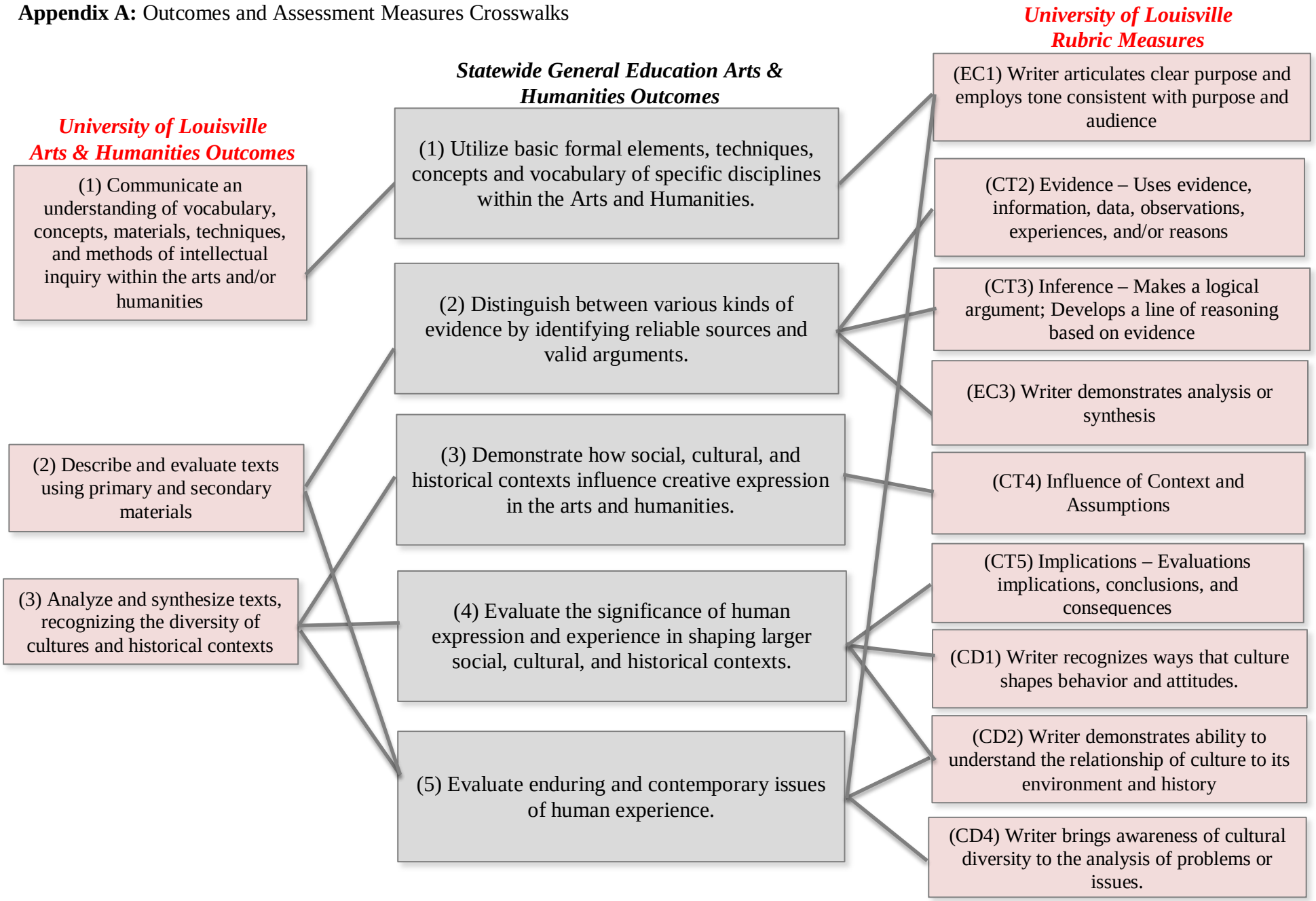
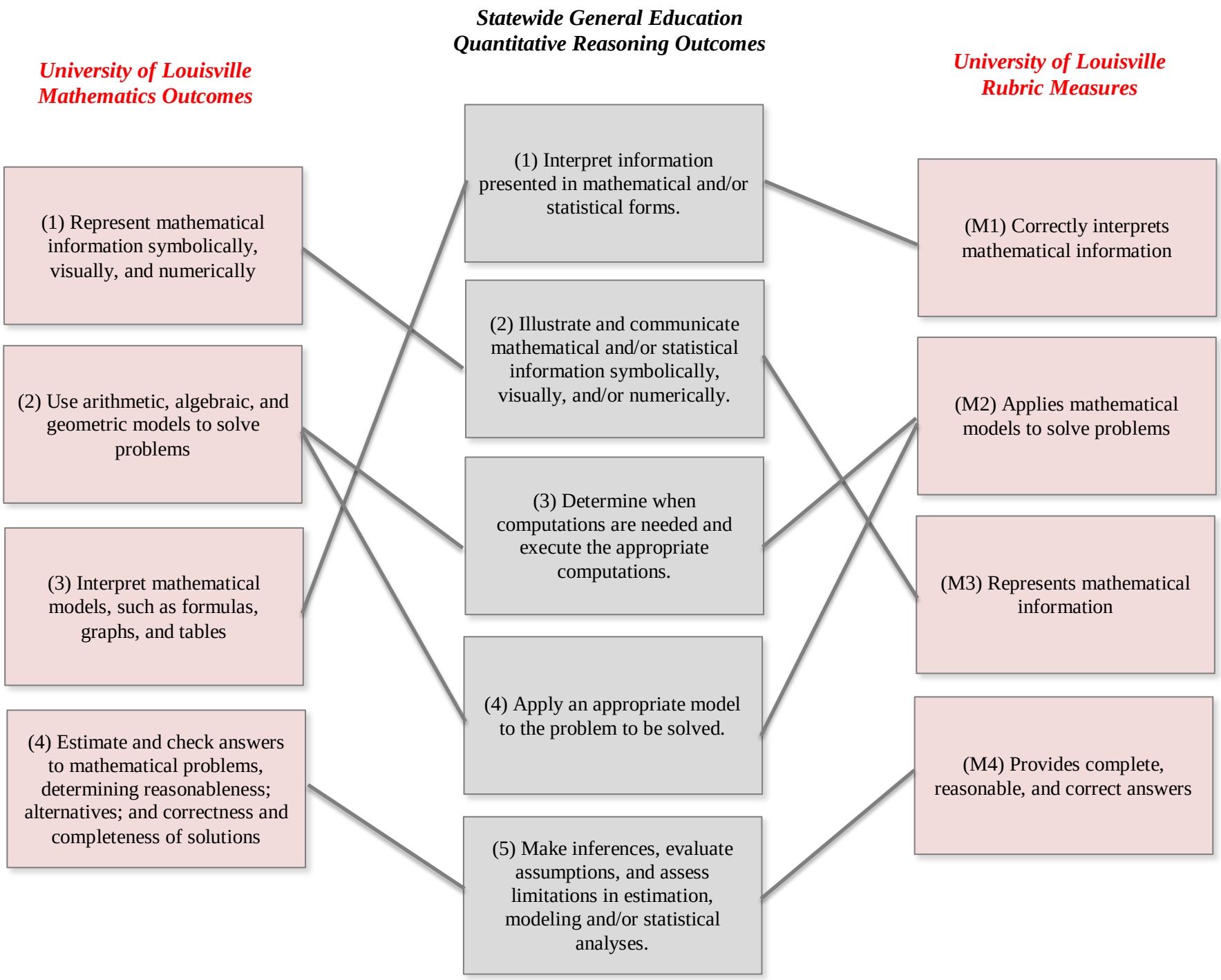
**Appendix A:** Outcomes and Assessment Measures Crosswalks




University of Louisville Mathematics Outcomes
Statewide General Education Quantitative Reasoning Outcomes
University of Louisville Rubric Measures
(1) Represent mathematical information symbolically, visually, and numerically
(2) Use arithmetic, algebraic, and geometric models to solve problems
(3) Interpret mathematical models, such as formulas, graphs, and tables
(4) Estimate and check answers to mathematical problems, determining reasonableness; alternatives; and correctness and completeness of solutions
(1) Interpret information presented in mathematical and/or statistical forms.
(2) Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically.
(3) Determine when computations are needed and execute the appropriate computations.
(4) Apply an appropriate model to the problem to be solved.
(5) Make inferences, evaluate assumptions, and assess limitations in estimation, modeling and/or statistical analyses.
(M1) Correctly interprets mathematical information
(M2) Applies mathematical models to solve problems
(M3) Represents mathematical information
(M4) Provides complete, reasonable, and correct answers

## Appendix B

General Education Arts & Humanities and Mathematics Syllabus Review (Fall 2015)

### History of the Syllabus Review

In 2012, the General Education Syllabus Review Project was initiated to evaluate the congruence of general education course syllabi with the approved content-specific general education student learning outcomes. Specifically, it was designed to determine: (a) if the student learning outcomes stated in each course syllabus are congruent with the approved content-specific general education learning outcomes, and (b) if corresponding assessment methods are stated that support the approved content-specific general education learning outcomes.

In the spring of 2015, the GECC Assessment Subcommittee proposed that the Syllabus Review Project be incorporated into the existing General Education Assessment Project. Therefore, the syllabi from each content area will be collected and reviewed by the Office of General Education Assessment in alignment with the corresponding assessment cycle.

This report summarizes the review process and the results of the syllabi review for the Arts & Humanities and Mathematics content areas.

### Review Process

The Provost requests that all faculty load their syllabi to Blackboard© each semester. These syllabi are then available through the university's course catalog system. For the purpose of this review, the Office of General Education Assessment collected all Arts & Humanities and Mathematics syllabi that were loaded to Blackboard or sent directly to the Office of General Education Assessment in fall 2015.

The review of syllabi sought to answer two questions:

1) Does the syllabus contain the content-specific general education learning outcomes approved for the course? (The statement can use either the exact language of the approved content-specific general education learning outcomes or they may be articulated using the instructor's own words, provided they are comprehensive in content and address all of the approved content-specific general education learning outcomes for the course.)

2) Are assessment methods stated that support the content-specific general education learning outcomes approved for the course?

An evaluation of the congruence between the listed assessment methods with the content-specific approved general education learning outcomes was not conducted when a reviewer determined that the syllabus does not contain a statement of the approved content-specific general education learning outcomes.

**Sample**

*Arts & Humanities*

The syllabus review included syllabi from 114 of the Arts & Humanities General Education course sections offered in the fall of 2015 resulting in a 95.8% sample. Syllabi were available for Asian Studies, Classical & Modern Languages, Education, English, Fine Arts, Humanities, Latin American & Latino Studies, Music History, Pan African Studies, Philosophy, Theatre Arts, and Women & Gender Studies. Appendix Table 1 provides a breakdown of the number of General Education courses offered in each area and the number of syllabi available by department.

Table 1.

*Arts & Humanities Sample*

| | Arts & Humanities General Education Courses Offered in 2015 | Syllabi Available |
|---|---|---|
| Asian Studies | 1 | 1, (100%) |
| Classical & Modern Languages | 2 | 2, (100%) |
| Education | 1 | 1, (100%) |
| English | 1 | 1, (100%) |
| Fine Arts | 16 | 16, (100%) |
| Humanities | 40 | 40, (100%) |
| Latin American & Latino Studies | 1 | 1, (100%) |
| Music History | 15 | 14, (93.3%) |
| Pan African Studies | 4 | 4, (100%) |
| Philosophy | 19 | 15, (78.9%) |
| Theatre Arts | 13 | 13, (100%) |
| Women & Gender Studies | 6 | 6, (100%) |
| **Total** | **119** | **114, (95.8%)** |

*Mathematics*

The review included syllabi from 101 of the Mathematics General Education course sections offered in the fall of 2015 resulting in a 99.0% sample. Syllabi were available for both Engineering and Mathematics courses and Appendix Table 2 provides a breakdown of the number of General Education courses offered in each area and the number of syllabi available by department.

Table 2.

*Mathematics Sample*

| | Arts & Humanities General Education Courses Offered in 2015 | Syllabi Available |
|---|---|---|
| Engineering | 19 | 19, (100%) |
| Mathematics | 83 | 82, (98.8%) |
| **Total** | **102** | **101, (99.0%)** |

**Results**

*Arts & Humanities*

The review of the 114 General Education Arts & Humanities syllabi identified 89 syllabi (78.1%) containing the content-specific general education learning outcomes approved for the course. Further review of the 89 syllabi containing the General Education Outcomes revealed that 65 syllabi (73.0%) also listed the assessment methods for the General Education Outcomes.

Table 3.

*Arts & Humanities Results*

| | Syllabi with General Education Outcomes Provided | Syllabi with Assessment Methods Stated |
|---|---|---|
| Asian Studies | 1, (100%) | 1, (100%) |
| Classical & Modern Languages | 2 | 2, (100%) |
| Education | 1, (100%) | 1, (100%) |
| English | 1, (100%) | 1, (100%) |
| Fine Arts | 10, (62.5%) | 5, (50.0%) |
| Humanities | 39, (97.5%) | 34, (87.2%) |
| Latin American & Latino Studies | 1, (100%) | 1, (100%) |
| Music History | 0 | Not applicable |
| Pan African Studies | 3, (75.0%) | 1, (25.0%) |
| Philosophy | 10, (66.7%) | 1, (10.0%) |
| Theatre Arts | 13, (100%) | 12, (92.3%) |
| Women & Gender Studies | 5, (83.3%) | 5, (100%) |
| **Total** | **89, (78.1%)** | **65, (73.0%)** |

*Mathematics*

The review of the 101 General Education Mathematics syllabi identified 81 syllabi (80.2%) containing the content-specific general education learning outcomes approved for the course. Further review of the 81 syllabi containing the General Education Outcomes revealed that 58 syllabi (71.6%) also listed the assessment methods for the General Education Outcomes.

Table 4.

*Mathematics Results*

| | Syllabi with General Education Outcomes Provided | Syllabi with Assessment Methods Stated |
|---|---|---|
| Engineering | 19, (100%) | 19, (100%) |
| Mathematics | 62, (75.6%) | 39, (62.9%) |
| **Total** | **81, (80.2%)** | **58, (71.6%)** |