Audio Technology Assessment Report
Fall 2018

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1 INTRODUCTION

Florida SouthWestern State College's Music Department employs a pre/post-test disposition survey as a means of assessing learning within the Audio Technology Certificate Program. The courses encompassed in this study include: MUS 2360 *Introduction to Music Technology*, MUM 2600C *Basic Audio Recording Technique*, MUM 2601C *Recording Techniques (II)*, and MUM 2604C *Multi-track Mixdown Techniques*. The Audio Technology Program initiated AY 2017-2018 developed an assessment plan and piloted it in Spring 2018. For Fall 2018, this assessment has expanded from MUM 2601C to the four coursed mentioned above. This report provides analysis of both the results of the assessment, as well as the assessment tool, in an effort to fine-tune the piloted assessment package.

For additional detail or further analysis not provided in this report, please contact Dr. Joseph F. van Gaalen, Asst. VP of Institutional Research, Assessment, and Effectiveness (jfvangaalen@fsw.edu; x16965).

2 ASSESSMENT RESULTS & RECOMMENDATIONS

2.1 MUS 2360

2.1.1 Assessment Tool

The assessment method utilizes a disposition survey administered as a pre-test and post-test to gauge growth in varying topics associated with the course outcomes. The disposition survey consists of 20 questions, each intended to be rated on the same scale as shown below:

- Strongly Agree
- Moderately Agree
- Agree
- Somewhat Agree
- Disagree

The questions used in the disposition survey are designed to ensure that by the end of term, students will have a strong knowledge of the core concepts of the course. The course outcomes for MUS 2360 applicable to this assessment are as follows:

1. Describe the historical interaction between technology and music.
2. Identify the properties of digital sound, and the technologies used to produce it.
3. Define the role of various computer hardware components used to create, produce, and distribute music.

4. Compare and contrast the functions and benefits of various computer software programs used to teach, create, or share music.
5. Describe the role of the internet in the creation and sharing of music.

The survey prompts of the disposition survey are shown below:

1. Can you describe what compression and rarefaction are as they relate to sound propagation?
2. Are you familiar with the mediums that allow sound to travel and their effect on sound waves?
3. Do you know all of the parts of the ear, and how sound is received by the brain?
4. Can you tell the difference between a rhythm transient and a ADSR wave?
5. Can you accurately explain the way that sound travels from the moment when a drum is struck until it reaches the listeners brain?
6. Do you know if there Is a difference between Hz and CPS and what they stand for?
7. Are you familiar with the differences of the 5 perceptional properties of sound vs. the 5 physical properties of sound?
8. Are you familiar with the 3 main (most common) types of microphones?
9. Are you familiar with the process of creating a well produced podcast?
10. Rate your experience working with ProTools.
11. Rate your experience with basic audio editing.
12. Rate your experience with basic MIDI input.
13. Rate your knowledge of the following digital effects: Reverb, Delay, and Modulation FX.
14. Rate your experience with basic MIDI editing.
15. Do you understand basic music theory? (pitch, duration, note, and rest values)
16. Can you enter notes, lyrics and chords into a score with a music notation program (Sibelius)?
17. Rate your knowledge of the following dynamic effects: EQ, and Compression.
18. Can you record audio into a DAW?
19. Are you familiar with tempo and changing the tempo value in a DAW?
20. Do you know the difference between Hi-Z and Lo-Z impedance?

2.1.2   Assessment Results

For the fall 2018 assessment, 9 artifacts were collected from the MUS 2360 pre-test and 10 from the post-test, accounting for 9 common artifacts between the pre-test and post-test. Results of pre-test and post-test by ordinal response percentage is shown in Figure 1 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Questions 4 and 15 exhibit the weakest growth. Question 4 ("Can you tell the difference between a rhythm transient and a ADSR wave?") exhibits only 44% change into a positive response compared to most other questions at 67% or higher. This is also the case for Question 15 ("Do you understand basic music theory? (pitch, duration, note, and rest values)") which exhibits only 33% change into a positive response. In Question 4 this is the result of limited growth. In Question 15 this is the result of pre-test scores being somewhat elevated to begin with, causing a more limited growth pattern.

	PRE-TEST More negative → More positive					POST-TEST More negative → More positive					CHANGE Negative	Neutral	Positive
1	56%	44%	0%	0%	0%	0%	0%	11%	44%	44%	-100%	11%	89%
2	33%	67%	0%	0%	0%	0%	11%	11%	56%	22%	-89%	11%	78%
3	56%	44%	0%	0%	0%	0%	0%	33%	22%	44%	-100%	33%	67%
4	67%	22%	11%	0%	0%	11%	22%	22%	11%	33%	-56%	11%	44%
5	56%	44%	0%	0%	0%	0%	0%	22%	33%	44%	-100%	22%	78%
6	78%	22%	0%	0%	0%	0%	11%	22%	33%	33%	-89%	22%	67%
7	78%	22%	0%	0%	0%	0%	0%	33%	33%	33%	-100%	33%	67%
8	67%	33%	0%	0%	0%	0%	11%	11%	22%	56%	-89%	11%	78%
9	100%	0%	0%	0%	0%	0%	0%	11%	33%	56%	-100%	11%	89%
10	78%	11%	0%	11%	0%	0%	0%	0%	56%	44%	-89%	0%	89%
11	22%	22%	44%	11%	0%	0%	0%	11%	33%	56%	-44%	-33%	78%
12	33%	44%	22%	0%	0%	0%	0%	11%	33%	56%	-78%	-11%	89%
13	33%	33%	33%	0%	0%	0%	0%	22%	11%	67%	-67%	-11%	78%
14	56%	11%	33%	0%	0%	0%	0%	22%	22%	56%	-67%	-11%	78%
15	33%	22%	0%	33%	11%	0%	0%	22%	11%	67%	-56%	22%	33%
16	67%	11%	22%	0%	0%	0%	11%	0%	22%	67%	-67%	-22%	89%
17	44%	56%	0%	0%	0%	0%	0%	22%	22%	44%	-100%	22%	67%
18	11%	56%	33%	0%	0%	0%	0%	11%	11%	78%	-67%	-22%	89%
19	22%	44%	33%	0%	0%	0%	11%	22%	11%	56%	-56%	-11%	67%
20	89%	11%	0%	0%	0%	22%	0%	11%	22%	33%	-78%	11%	56%

Scale (CHANGE): 90%, 60%, 30%, 0%, -30%, -60%, -90%

Scale (PRE/POST): 0%, 20%, 40%, 60%, 80%, 100%

*Figure 1. **FALL 2018** Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "Disagree", "Somewhat Agree", "Agree", "Moderately Agree", and "Strongly Agree."*

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 2). In other words, instead of reviewing the percentage of those responding negatively or positively to a particular prompt, we can review growth based on the overall percentage of those questions answered "Disagree" versus those answered "Strongly Agree." In short, nine respondents mean a comparison of 180 questions answered (20 questions per respondent). In this comparison, 54% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 2%. Similarly, 1% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 49%.
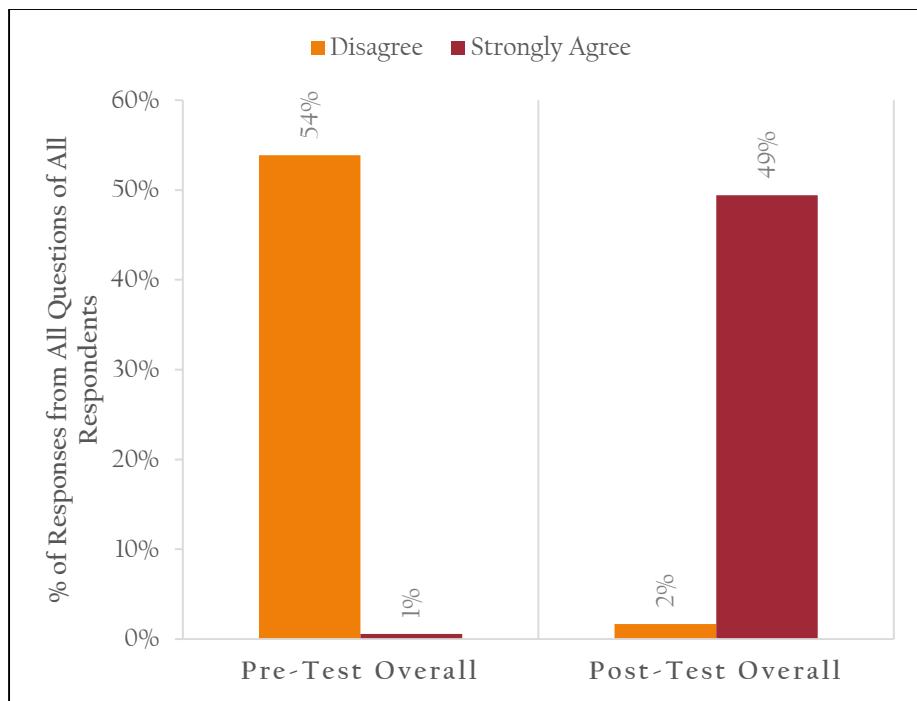
Figure 2. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test. For example, 54% reporting "Disagree" in Pre-Test is 54% of 180 responses (20 questions times 9 respondents).

2.1.3 Assessment Recommendations

While both the results and confirmation from the faculty administering the disposition survey that students reported a clear understanding when completing the survey support the validity of the results, it is important to note that the questions, in the manner currently devised, may lead to confusion in future studies. What follows are some suggestions (original in black, suggested in blue) based on standard survey writing techniques to ensure clarity over time (Kuh et al., 2015).

The survey prompts of the disposition survey are shown below:

1. Can you describe what compression and rarefaction are as they relate to sound propagation?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
2. Are you familiar with the mediums that allow sound to travel and their effect on sound waves?
    a. Change response options to:
        i. Very familiar
        ii. Familiar
        iii. Somewhat familiar
        iv. Minimally familiar
        v. Not at all familiar
3. Do you know all of the parts of the ear, and how sound is received by the brain?

a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
4. Can you tell the difference between a rhythm transient and a ADSR wave?
   a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
5. Can you accurately explain the way that sound travels from the moment when a drum is struck until it reaches the listeners brain?
   a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
6. Do you know if there Is a difference between Hz and CPS and what they stand for?
   a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
7. Are you familiar with the differences of the 5 perceptional properties of sound vs. the 5 physical properties of sound?
   a. Change response options to:
      i. Very familiar
      ii. Familiar
      iii. Somewhat familiar
      iv. Minimally familiar
      v. Not at all familiar
8. Are you familiar with the 3 main (most common) types of microphones?
   a. Change response options to:
      i. Very familiar
      ii. Familiar
      iii. Somewhat familiar
      iv. Minimally familiar
      v. Not at all familiar
9. Are you familiar with the process of creating a well produced podcast?

a. Change response options to:
        i. Very familiar
        ii. Familiar
        iii. Somewhat familiar
        iv. Minimally familiar
        v. Not at all familiar
10. Rate your experience working with ProTools.
    a. Change response options to:
        i. Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v. No experience
11. Rate your experience with basic audio editing.
    a. Change response options to:
        i. Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v. No experience
12. Rate your experience with basic MIDI input.
    a. Change response options to:
        i. Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v. No experience
13. Rate your knowledge of the following digital effects: Reverb, Delay, and Modulation FX.
    a. Change response options to:
        i. Very knowledgeable
        ii. Knowledgeable
        iii. Somewhat knowledgeable
        iv. Minimal knowledge
        v. None
14. Rate your experience with basic MIDI editing.
    a. Change response options to:
        i. Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v. No experience
15. Do you understand basic music theory? (pitch, duration, note, and rest values)
    a. Change response options to:
        i. Yes, very accurately

  ii. Yes, accurately

  iii. Yes, somewhat accurately

  iv. No, not very accurately

  v. No, not at all

16. Can you enter notes, lyrics and chords into a score with a music notation program (Sibelius)?

 a. Change response options to:

  i. Yes, very accurately

  ii. Yes, accurately

  iii. Yes, somewhat accurately

  iv. No, not very accurately

  v. No, not at all

17. Rate your knowledge of the following dynamic effects: EQ, and Compression.

 a. Change response options to:

  i. Very knowledgeable

  ii. Knowledgeable

  iii. Somewhat knowledgeable

  iv. Minimal knowledge

  v. None

18. Can you record audio into a DAW?

 a. Change response options to:

  i. Yes, very accurately

  ii. Yes, accurately

  iii. Yes, somewhat accurately

  iv. No, not very accurately

  v. No, not at all

19. Are you familiar with tempo and changing the tempo value in a DAW?

 a. Change response options to:

  i. Very familiar

  ii. Familiar

  iii. Somewhat familiar

  iv. Minimally familiar

  v. Not at all familiar

20. Do you know the difference between Hi-Z and Lo-Z impedance?

 a. Change response options to:

  i. Yes, very accurately

  ii. Yes, accurately

  iii. Yes, somewhat accurately

  iv. No, not very accurately

  v. No, not at all

2.2   MUM 2600C

2.2.1   Assessment Tool

The assessment method utilizes a disposition survey administered as a pre-test and post-test to gauge growth in varying topics associated with the course outcomes. The disposition survey consists of 10 questions, each intended to be rated on the same scale as shown below:

- Strongly Agree
- Moderately Agree
- Agree
- Somewhat Agree
- Disagree

The questions used in the disposition survey are designed to ensure that by the end of term, students will have a strong knowledge of the core concepts of the course. The course outcomes for MUM 2600C applicable to this assessment are as follows:

1. Recognition of various audio aesthetics and identification of various properties of sound.
2. Describe and practice fundamentals of audio and post-production techniques.
3. Identify components of a sound studio and the responsibilities of individuals (such as studio manager, recording engineer, etc.) with that environment.
4. Compare and contrast analog and digital audio production technology.

The survey prompts of the disposition survey are shown below:

1. Rate your knowledge of the Protools File Menu functions.
2. Rate your knowledge of the Protools Edit Menu functions.
3. Can you accurately explain what a buffer is and the effect it has on latency?
4. How familiar are you with the editing technique called vocal leveling?
5. Can you describe the roles of the tracking engineer, editing engineer, and mastering engineer?
6. How do you rate your knowledge of mixing for vocals?
7. How do you rate your knowledge of mixing for electric guitars?
8. How do you rate your knowledge of mixing for drums?
9. How do you rate your knowledge of mixing for bass guitar?
10. Are you familiar with the process of bouncing, rendering or mixing down your tracks?

2.2.2   Assessment Results

For the fall 2018 assessment, 8 artifacts were collected from the MUM 2600C pre-test and 10 from the post-test, accounting for 8 common artifacts between the pre-test and post-test. Results of pre-test and post-test by ordinal response percentage is shown in Figure 3 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Positive growth percentages range from 73% to 88%. The weakest growth is in question 5, "5. Can you describe the roles of the tracking engineer, editing engineer, and mastering engineer?," which exhibits a decline in negative responses of only 48% (compared to 63%-75% in all other questions) but still a growth in positive response of 73%. It is clear from the results of the study that students exhibit limited confidence upon entering the course and then exhibit growth.

	PRE-TEST					POST-TEST					CHANGE				
	More negative			More positive		More negative			More positive		Negative	Neutral	Positive		Scale
1	50%	25%	0%	25%	0%	0%	0%	0%	25%	75%	-75%	0%	75%		
2	50%	25%	0%	25%	0%	0%	0%	0%	13%	88%	-75%	0%	75%		90%
3	63%	13%	13%	0%	13%	0%	13%	0%	50%	38%	-63%	-13%	75%		60%
4	50%	25%	13%	13%	0%	0%	0%	0%	13%	88%	-75%	-13%	88%		30%
5	25%	38%	25%	0%	13%	0%	14%	0%	29%	57%	-48%	-25%	73%		0%
6	63%	0%	25%	0%	13%	0%	0%	0%	50%	50%	-63%	-25%	88%		-30%
7	50%	25%	13%	13%	0%	0%	0%	13%	38%	50%	-75%	0%	75%		-60%
8	50%	25%	13%	13%	0%	0%	0%	0%	63%	38%	-75%	-13%	88%		-90%
9	50%	25%	0%	25%	0%	0%	0%	0%	50%	50%	-75%	0%	75%		
10	50%	13%	25%	0%	13%	0%	0%	0%	13%	88%	-63%	-25%	88%		

	Scale	0%	20%	40%	60%	80%	100%

Figure 3. FALL 2018 Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "Disagree", "Somewhat Agree", "Agree", "Moderately Agree", and "Strongly Agree."

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 4). In other words, instead of reviewing the percentage of those responding negatively or positively to a particular prompt, we can review growth based on the overall percentage of those questions answered "Disagree" versus those answered "Strongly Agree." In short, eight respondents mean a comparison of 80 questions answered (10 questions per respondent). In this comparison, 50% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 5% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 62%.
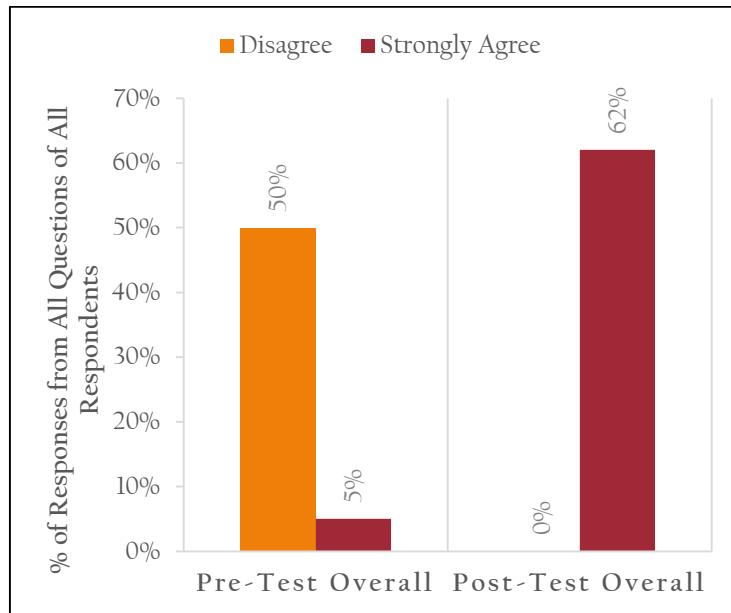

Figure 4. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test. For example, 50% reporting "Disagree" in Pre-Test is 50% of 80 responses (10 questions times 8 respondents).

2.2.3   Assessment Recommendations

While both the results and confirmation from the faculty administering the disposition survey that students reported a clear understanding when completing the survey support the validity of the results, it is important to note that the questions, in the manner currently devised, may lead to confusion in future studies.   What follows are some suggestions (original in black, suggested in blue) based on standard survey writing techniques to ensure clarity over time (Kuh et al., 2015).

The survey prompts of the disposition survey are shown below:

1. Rate your knowledge of the Protools File Menu functions.
   a. Change response options to:
      i. Very experienced
      ii. Experienced
      iii. Somewhat experienced
      iv. Minimally experienced
      v. No experience
2. Rate your knowledge of the Protools File Menu functions.
   a. This prompt is identical to prompt one, which may be in error.   Suggest eliminating question or revising.
3. Can you accurately explain what a buffer is and the effect it has on latency?
   a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
4. How familiar are you with the editing technique called vocal leveling?
   a. Change response options to:
      i. Very familiar
      ii. Familiar
      iii. Somewhat familiar
      iv. Minimally familiar
      v. Not at all familiar
5. Can you describe the roles of the tracking engineer, editing engineer, and mastering engineer?
   a. Change response options to:
      i. Yes, very accurately
      ii. Yes, accurately
      iii. Yes, somewhat accurately
      iv. No, not very accurately
      v. No, not at all
6. How do you rate your knowledge of mixing for vocals?
   a. Change response options to:
      i. Very knowledgeable
      ii. Knowledgeable
      iii. Somewhat knowledgeable

   iv. Minimal knowledge

   v. None

7. How do you rate your knowledge of mixing for electric guitars?

  a. Change response options to:

   i. Very knowledgeable

   ii. Knowledgeable

   iii. Somewhat knowledgeable

   iv. Minimal knowledge

   v. None

8. How do you rate your knowledge of mixing for drums?

  a. Change response options to:

   i. Very knowledgeable

   ii. Knowledgeable

   iii. Somewhat knowledgeable

   iv. Minimal knowledge

   v. None

9. How do you rate your knowledge of mixing for bass guitar?

  a. Change response options to:

   i. Very knowledgeable

   ii. Knowledgeable

   iii. Somewhat knowledgeable

   iv. Minimal knowledge

   v. None

10. Are you familiar with the process of bouncing, rendering or mixing down your tracks?

  a. Change response options to:

   i. Very familiar

   ii. Familiar

   iii. Somewhat familiar

   iv. Minimally familiar

   v. Not at all familiar

2.3 MUM 2601C

2.3.1 Assessment Tool

The assessment method utilizes a disposition survey administered as a pre-test and post-test to gauge growth in varying topics associated with the course outcomes. The disposition survey consists of 10 questions, each intended to be rated on the same scale as shown below:

- Strongly Agree
- Moderately Agree
- Agree
- Somewhat Agree
- Disagree

The questions used in the disposition survey are designed to ensure that by the end of term, students will have a strong knowledge of the core concepts of the course. The course outcomes for MUM 2601C applicable to this assessment are as follows:

1. Apply knowledge of microphone, monitor, amplifier design through appropriate setup.
2. Describe and apply knowledge of signal flow and processing.
3. Demonstrate recording, mix down and mastering processes.
4. Describe aspects of digital and physical music recording production, manufacture, and distribution.

The survey prompts of the disposition survey are shown below:

1. Rate your experience with a mixing console.
2. Rate your experience with recording equipment direct to hard drive and direct to DAW.
3. Knowledge of recording room acoustics, diffusion vs. absorption and what frequencies are affected.
4. General differences in tonal quality as it relates to microphone proximity (placement).
5. Recording vocal tracks, miking techniques, and track capturing.
6. Recording Acoustic Guitar tracks, miking techniques, DI, and track capturing.
7. Recording Bass Guitar tracks, miking techniques, DI, and track capturing.
8. Recording drum / percussion tracks, close and far miking techniques, multiple vs. zone miking, and track capturing levels.
9. Recording electric guitar tracks, close and far miking techniques, multiple mics vs. DI, software modeling, and track capturing levels.
10. Rate your knowledge of microphone types, and the instruments that they should be used on.

2.3.2 Assessment Results

For the fall 2018 assessment, 6 artifacts were collected from the MUM 2601C pre-test and 6 from the post-test, accounting for 6 common artifacts between the pre-test and post-test. Results of pre-test and post-test by ordinal response percentage is shown in Figure 5 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Questions 2 and 4, "Rate your experience with recording equipment direct to hard drive and direct to DAW" and "General differences in tonal quality as it relates to microphone proximity (placement)", are the only questions which exhibit growth less than 80%. In spring 2018, it was question 1, "Rate your experience with a mixing console" which exhibited the weakest growth (see Figure 6 Spring 2018 results for comparison). From an individual perspective, students exhibit limited confidence upon entering the course and then exhibit growth.

PRE-TEST More negative → More positive					POST-TEST More negative → More positive					CHANGE Negative	Neutral	Positive
1	50%	17%	17%	17%	0%	0%	0%	0%	50%	50%	-67%	-17%	83%
2	17%	33%	17%	17%	17%	0%	0%	0%	33%	67%	-50%	-17%	67%
3	67%	17%	17%	0%	0%	0%	0%	0%	50%	50%	-83%	-17%	100%
4	50%	17%	17%	17%	0%	0%	0%	17%	17%	67%	-67%	0%	67%
5	17%	67%	17%	0%	0%	0%	0%	0%	50%	50%	-83%	-17%	100%
6	33%	50%	0%	17%	0%	0%	0%	0%	33%	67%	-83%	0%	83%
7	33%	50%	0%	17%	0%	0%	0%	0%	17%	83%	-83%	0%	83%
8	33%	50%	17%	0%	0%	0%	0%	0%	33%	67%	-83%	-17%	100%
9	33%	67%	0%	0%	0%	0%	0%	0%	33%	67%	-100%	0%	100%
10	33%	50%	17%	0%	0%	0%	0%	17%	67%	17%	-83%	0%	83%

Scale: 0% | 20% | 40% | 60% | 80% | 100%

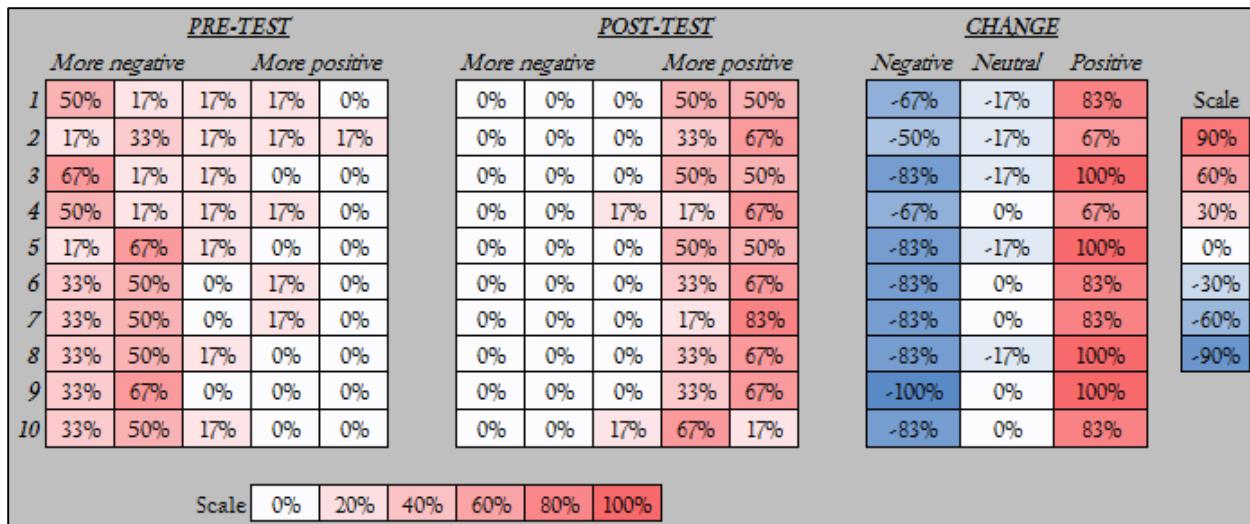Scale (Change): 90% | 60% | 30% | 0% | -30% | -60% | -90%

*Figure 5. **FALL 2018** Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "Disagree", "Somewhat Agree", "Agree", "Moderately Agree", and "Strongly Agree."*

PRE-TEST More negative → More positive					POST-TEST More negative → More positive					CHANGE Negative	Neutral	Positive
1	75%	0%	0%	25%	0%	0%	10%	0%	30%	60%	-65%	0%	65%
2	17%	8%	67%	8%	0%	0%	0%	0%	50%	50%	-25%	-67%	92%
3	50%	42%	8%	0%	0%	0%	0%	10%	30%	60%	-92%	2%	90%
4	50%	17%	33%	0%	0%	0%	0%	0%	20%	80%	-67%	-33%	100%
5	50%	8%	33%	0%	8%	0%	0%	10%	20%	70%	-58%	-23%	82%
6	42%	42%	8%	8%	0%	0%	0%	10%	40%	50%	-83%	2%	82%
7	42%	33%	17%	8%	0%	0%	0%	10%	20%	70%	-75%	-7%	82%
8	58%	25%	0%	17%	0%	0%	0%	0%	40%	60%	-83%	0%	83%
9	45%	27%	9%	0%	0%	0%	0%	0%	40%	60%	-73%	-9%	100%
10	33%	25%	42%	0%	0%	0%	0%	0%	70%	30%	-58%	-42%	100%

Scale: 0% | 20% | 40% | 60% | 80% | 100%

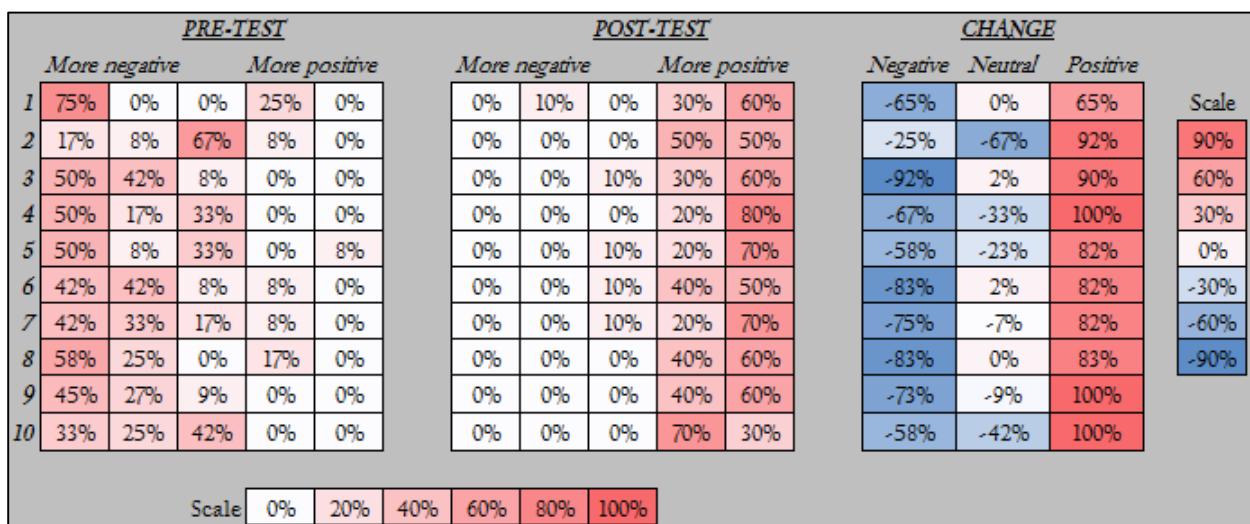Scale (Change): 90% | 60% | 30% | 0% | -30% | -60% | -90%

*Figure 6. **SPRING 2018** Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "Disagree", "Somewhat Agree", "Agree", "Moderately Agree", and "Strongly Agree."*

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 7). In other words, instead of reviewing the percentage of those responding negatively or positively to a particular prompt, we can review growth based on the overall percentage of those questions answered "Disagree" versus those answered "Strongly Agree." In short, six respondents mean a comparison of 60 questions answered (10 questions per respondent). In this comparison, 37% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 2% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 58%.
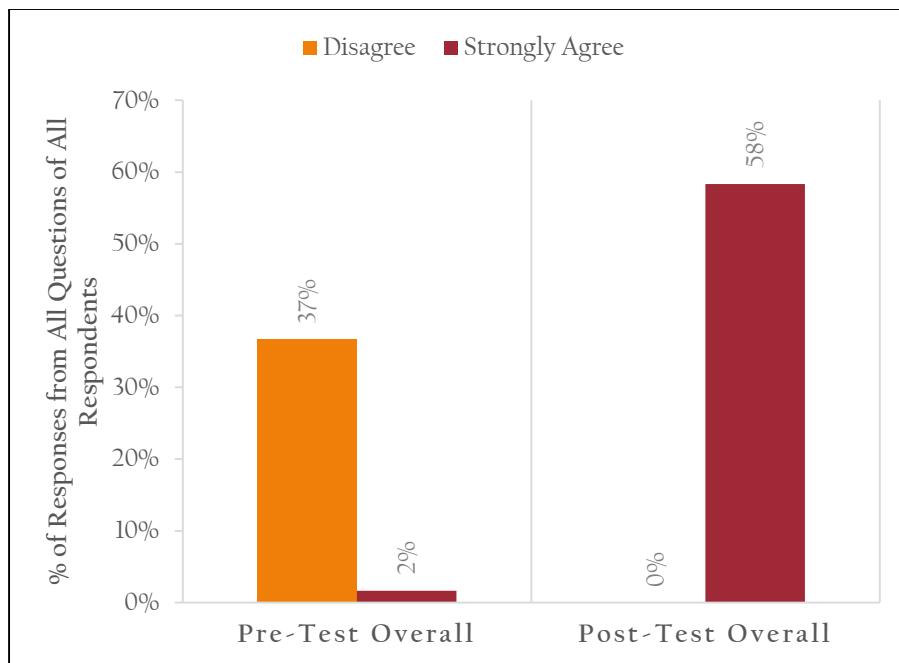
Figure 7. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test. For example, 37% reporting "Disagree" in Pre-Test is 37% of 60 responses (10 questions times 6 respondents).

2.3.3   Assessment Recommendations

While both the results and confirmation from the faculty administering the disposition survey that students reported a clear understanding when completing the survey support the validity of the results, it is important to note that the questions, in the manner currently devised, may lead to confusion in future studies. What follows are some suggestions (original in black, suggested in blue) based on standard survey writing techniques to ensure clarity over time (Kuh et al., 2015).

The survey prompts of the disposition survey are shown below:

1. Rate your experience with a mixing console.
    a. Change response options to:
        i.   Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v.   No experience
2. Rate your experience with recording equipment direct to hard drive and direct to DAW.
    a. Change response options to:
        i.   Very experienced
        ii. Experienced
        iii. Somewhat experienced
        iv. Minimally experienced
        v.   No experience
3. Rate your knowledge of recording room acoustics, diffusion vs. absorption, and what frequencies are affected.

  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

4. Rate your knowledge of general differences in tonal quality as it relates to microphone proximity (placement).
  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

5. Rate your knowledge of recording vocal tracks, miking techniques, and track capturing.
  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

6. Rate your knowledge of recording Acoustic Guitar tracks, miking techniques, DI, and track capturing.
  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

7. Rate your knowledge of recording Bass Guitar tracks, miking techniques, DI, and track capturing.
  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

8. Rate your knowledge of recording drum / percussion tracks, close and far miking techniques, multiple vs. zone miking, and track capturing levels.
  a. Change response options to:
    i. Very knowledgeable
    ii. Knowledgeable
    iii. Somewhat knowledgeable
    iv. Minimal knowledge
    v. None

9. Rate your knowledge of recording electric guitar tracks, close and far miking techniques, multiple mics vs. DI, software modeling, and track capturing levels.
   a. Change response options to:
      i. Very knowledgeable
      ii. Knowledgeable
      iii. Somewhat knowledgeable
      iv. Minimal knowledge
      v. None
10. Rate your knowledge of rate your knowledge of microphone types, and the instruments that they should be used on.
    a. Change response options to:
       i. Very knowledgeable
       ii. Knowledgeable
       iii. Somewhat knowledgeable
       iv. Minimal knowledge
       v. None

2.4   MUM 2604C

2.4.1   Assessment Tool

The assessment method utilizes a disposition survey administered as a pre-test and post-test to gauge growth in varying topics associated with the course outcomes. The disposition survey consists of 10 questions, each intended to be rated on the same scale as shown below:

- Strongly Agree
- Moderately Agree
- Agree
- Somewhat Agree
- Disagree

The questions used in the disposition survey are designed to ensure that by the end of term, students will have a strong knowledge of the core concepts of the course. The course outcomes for MUM 2601C applicable to this assessment are as follows:

1. Describe effective sound and mix design.
2. Demonstrate equalization and dynamics processing.
3. Compare and contrast techniques for mixing vocal, drum, and instrumental tracks.
4. Demonstrate multi-track mixdown, editing, and final cut tracks on digital and analog masters.

The survey prompts of the disposition survey are shown below:

1. Rate your knowledge of the Side Chain Compression technique
2. Rate your knowledge of the sample replacement / sample enhancement technique.
3. Rate your knowledge of the Mastering process.
4. Do you understand how to EQ a mixing room monitor system?
5. Do you know the process to find standing waves and signal cancellation in a monitoring room?

6. Do you understand the difference between imaging and panning?
7. Do you understand the difference between Analog and Digital mastering?
8. Can you tell the difference between mixing styles: East coast, West coast, Southern, and European?
9. Rate your knowledge of what a RTA is and how it is used.
10. Rate your understanding of post mixdown or mastering automation.

2.4.2   Assessment Results

For the fall 2018 assessment, 6 artifacts were collected from the MUM 2604C pre-test and 8 from the post-test, accounting for 6 common artifacts between the pre-test and post-test. Results of pre-test and post-test by ordinal response percentage is shown in Figure 8 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Question 5, "Do you know the process to find standing waves and signal cancellation in a monitoring room?" exhibits a growth of 50%, the lowest of any question. From an individual perspective, an interpretation of these values would mean students enter the course with some to little confidence in the topics and then exhibit growth.

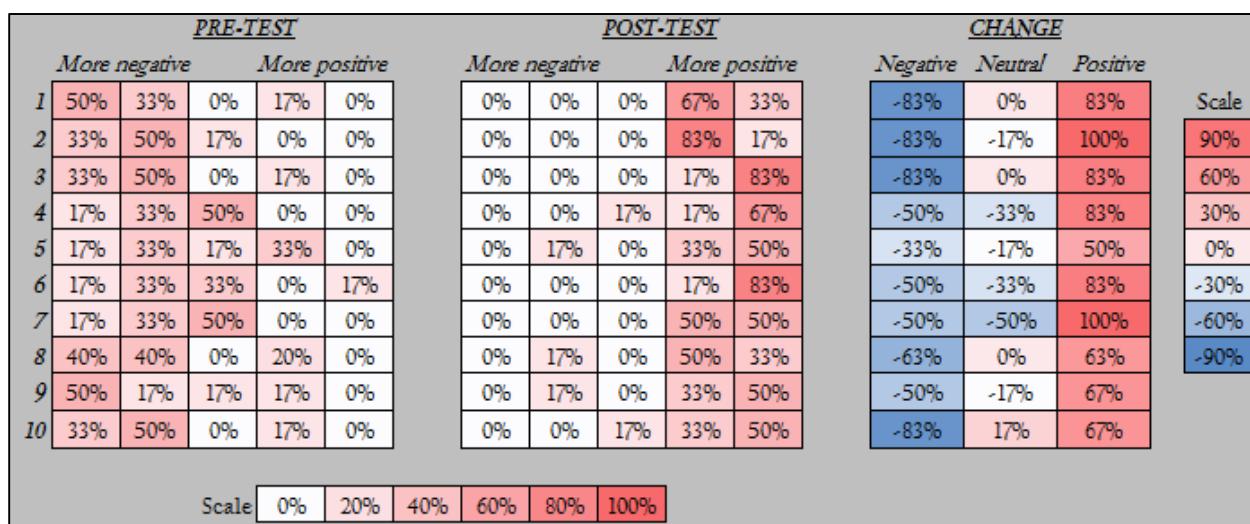|	PRE-TEST					POST-TEST					CHANGE				
	More negative			More positive		More negative			More positive		Negative	Neutral	Positive		Scale
1	50%	33%	0%	17%	0%	0%	0%	0%	67%	33%	-83%	0%	83%		
2	33%	50%	17%	0%	0%	0%	0%	0%	83%	17%	-83%	-17%	100%		90%
3	33%	50%	0%	17%	0%	0%	0%	0%	17%	83%	-83%	0%	83%		60%
4	17%	33%	50%	0%	0%	0%	0%	17%	17%	67%	-50%	-33%	83%		30%
5	17%	33%	17%	33%	0%	0%	17%	0%	33%	50%	-33%	-17%	50%		0%
6	17%	33%	33%	0%	17%	0%	0%	0%	17%	83%	-50%	-33%	83%		-30%
7	17%	33%	50%	0%	0%	0%	0%	0%	50%	50%	-50%	-50%	100%		-60%
8	40%	40%	0%	20%	0%	0%	17%	0%	50%	33%	-63%	0%	63%		-90%
9	50%	17%	17%	17%	0%	0%	17%	0%	33%	50%	-50%	-17%	67%		
10	33%	50%	0%	17%	0%	0%	0%	17%	33%	50%	-83%	17%	67%		

Scale: 0% | 20% | 40% | 60% | 80% | 100%

*Figure 8. **FALL 2018** Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "Disagree", "Somewhat Agree", "Agree", "Moderately Agree", and "Strongly Agree."*

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 9). In other words, instead of reviewing the percentage of those responding negatively or positively to a particular prompt, we can review growth based on the overall percentage of those questions answered "Disagree" versus those answered "Strongly Agree." In short, six respondents mean a comparison of 60 questions answered (10 questions per respondent). In this comparison, 31% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 2% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 52%.
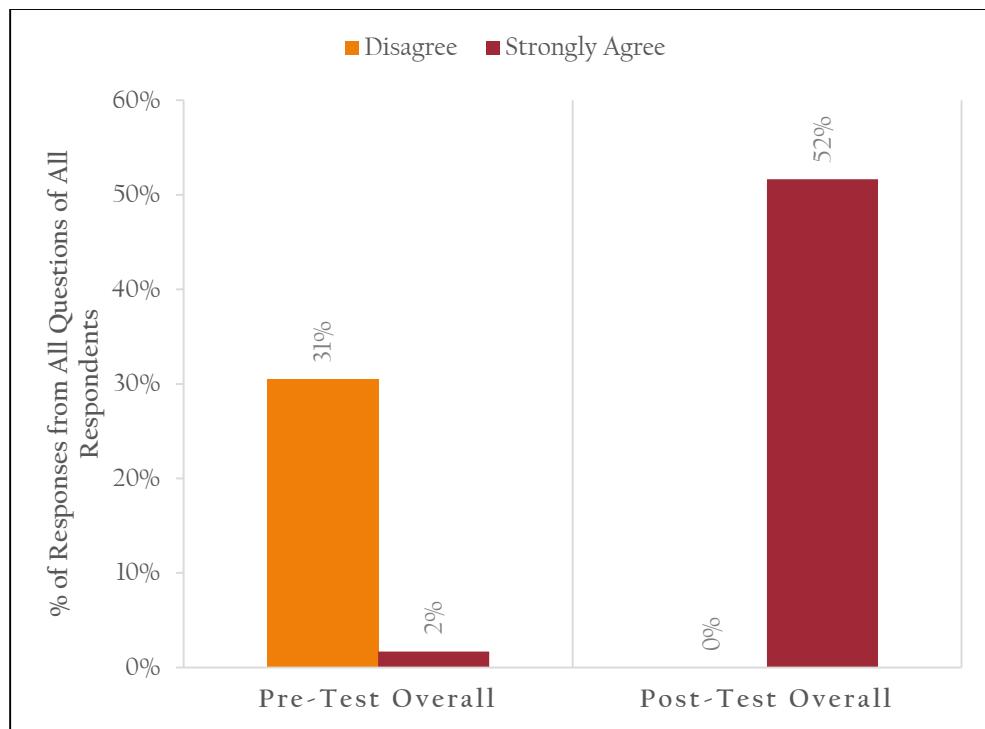
Figure 9. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test. For example, 31% reporting "Disagree" in Pre-Test is 31% of 60 responses (10 questions times 6 respondents).

2.4.3 Assessment Recommendations

While both the results and confirmation from the faculty administering the disposition survey that students reported a clear understanding when completing the survey support the validity of the results, it is important to note that the questions, in the manner currently devised, may lead to confusion in future studies. What follows are some suggestions (original in black, suggested in blue) based on standard survey writing techniques to ensure clarity over time (Kuh et al., 2015).

The survey prompts of the disposition survey are shown below:

1. Rate your knowledge of the Side Chain Compression technique.
   a. Change response options to:
      i. Very knowledgeable
      ii. Knowledgeable
      iii. Somewhat knowledgeable
      iv. Minimal knowledge
      v. None
2. Rate your knowledge of the sample replacement / sample enhancement technique.
   a. Change response options to:
      i. Very knowledgeable
      ii. Knowledgeable
      iii. Somewhat knowledgeable
      iv. Minimal knowledge
      v. None

3. Rate your knowledge of the Mastering process.
    a. Change response options to:
        i. Very knowledgeable
        ii. Knowledgeable
        iii. Somewhat knowledgeable
        iv. Minimal knowledge
        v. None
4. Do you understand how to EQ a mixing room monitor system?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
5. Do you know the process to find standing waves and signal cancellation in a monitoring room?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
6. Do you understand the difference between imaging and panning?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
7. Do you understand the difference between Analog and Digital mastering?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
8. Can you tell the difference between mixing styles: East coast, West coast, Southern, and European?
    a. Change response options to:
        i. Yes, very accurately
        ii. Yes, accurately
        iii. Yes, somewhat accurately
        iv. No, not very accurately
        v. No, not at all
9. Rate your knowledge of what a RTA is and how it is used.

a.   Change response options to:
                i.   Very knowledgeable
               ii.   Knowledgeable
              iii.   Somewhat knowledgeable
               iv.   Minimal knowledge
                v.   None
10. Rate your understanding of post mixdown or mastering automation.
        a.   Change response options to:
                i.   Very knowledgeable
               ii.   Knowledgeable
              iii.   Somewhat knowledgeable
               iv.   Minimal knowledge
                v.   None

3   PROGRAM-WIDE COMPARISON

As survey prompts are most often unique to each course, a global comparison by looking at these results by comparing growth from pre-test to post-test utilizing overall responses may be helpful (Figure 10). In other words, instead of reviewing the percentage of those responding negatively or positively to a particular prompt, we can review growth based on the overall percentage of those questions answered "Disagree" versus those answered "Strongly Agree."   In short, 31 respondents mean a comparison of 380 questions answered (10 questions per respondent or 20 questions for MUS 2360).   In this comparison, 47% of all pre-test questions answered were answered with "Disagree," or the most negative response.   In the post-test, that percentage is 1%.   Similarly, 2% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 54%.
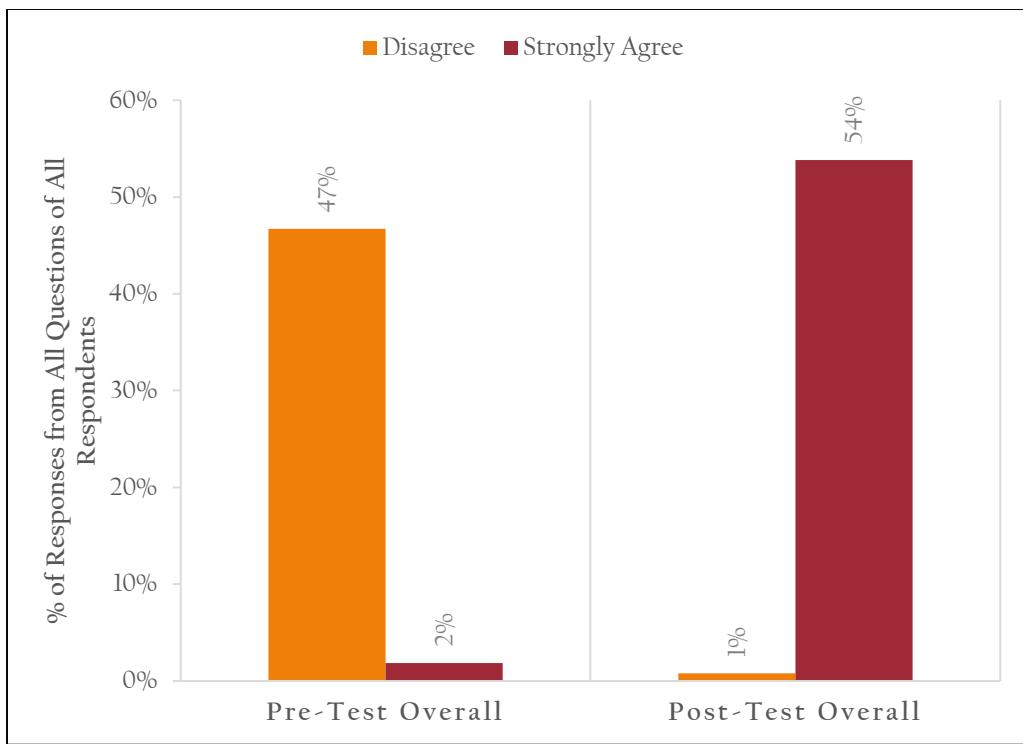
Figure 10. Comparison of percentage of responses from all questions by all respondents across all Audio Technology courses in the assessment plan reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test. For example, 47% reporting "Disagree" in Pre-Test is 47% of 380 responses (10 questions times 38 respondents)

4 COHORT COMPARISONS

4.1 DUAL ENROLLMENT (CONCURRENT) TO TRADITIONAL COMPARISON

No dual enrollment (concurrent) sections are offered for this course and so no comparison could be completed.

4.2 ONLINE TO TRADITIONAL COMPARISON

No online sections are offered for this course and so no comparison could be completed.

4.3 COMPARISON BY CAMPUS/SITE

The course is only taught at one location (Thomas Edison) and so no cross-campus comparison can be completed.

5 CONCLUSIONS

The Audio Technology Program initiated AY 2017-2018 developed an assessment plan and piloted it in Spring 2018. For Fall 2018, this assessment has expanded from MUM 2601C to the four coursed mentioned above. The courses encompassed in this study include: MUS 2360 *Introduction to Music*

Technology, MUM 2600C *Basic Audio Recording Technique*, MUM 2601C *Recording Techniques (II)*, and MUM 2604C *Multi-track Mixdown Techniques*. This report provides analysis of both the results of the assessment, as well as the assessment tool, in an effort to fine-tune the piloted assessment package.

5.1   MUS 2360

A drilldown of results are as follows:
1. For the fall 2018 assessment, 9 artifacts were collected from the MUS 2360 pre-test and 10 from the post-test, accounting for 9 common artifacts between the pre-test and post-test.
2. In a comparison of pre-test to post-test changes in survey responses by question, increases in positive response are visible for all questions and exhibit exceptional growth. Questions 4 and 15 exhibit the weakest growth. Question 4 ("Can you tell the difference between a rhythm transient and a ADSR wave?") exhibits only 44% change into a positive response compared to most other questions at 67% or higher. This is also the case for Question 15 ("Do you understand basic music theory? (pitch, duration, note, and rest values)") which exhibits only 33% change into a positive response. In Question 4 this is the result of limited growth. In Question 15 this is the result of pre-test scores being somewhat elevated to begin with, causing a more limited growth pattern.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, 54% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 2%. Similarly, 1% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 49%.
4. Some slight re-wording of survey prompts and response options is recommended to ensure clarity of the results going forward.

5.2   MUM 2600C

A drilldown of results are as follows:
1. For the fall 2018 assessment, 8 artifacts were collected from the MUM 2600C pre-test and 10 from the post-test, accounting for 8 common artifacts between the pre-test and post-test.
2. In a comparison of pre-test to post-test changes in survey responses by question, increases in positive response are visible for all questions and exhibit exceptional growth. Positive growth percentages range from 73% to 88%. The weakest growth is in question 5, "5. Can you describe the roles of the tracking engineer, editing engineer, and mastering engineer?," which exhibits a decline in negative responses of only 48% (compared to 63%-75% in all other questions) but still a growth in positive response of 73%.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, we see that 50% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 5% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 62%.
4. Some slight re-wording of survey prompts and response options is recommended to ensure clarity of the results going forward. Additionally, the first prompt is identical to the second, which may be in error. Suggest eliminating or revising.

5.3 MUM 2601C

A drilldown of results are as follows:

1. For the fall 2018 assessment, 6 artifacts were collected from the MUM 2601C pre-test and 6 from the post-test, accounting for 6 common artifacts between the pre-test and post-test.
2. In a comparison of pre-test to post-test changes in survey responses by question, increases in positive response are visible for all questions and exhibit exceptional growth. Questions 2 and 4, "Rate your experience with recording equipment direct to hard drive and direct to DAW" and "General differences in tonal quality as it relates to microphone proximity (placement)", are the only questions which exhibit growth less than 80%. In spring 2018, it was question 1, "Rate your experience with a mixing console" which exhibited the weakest growth (see Figure 6 Spring 2018 results for comparison).
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, we see that 37% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 2% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 58%.
4. Some slight re-wording of survey prompts and response options is recommended to ensure clarity of the results going forward.

5.4 MUM 2604C

A drilldown of results are as follows:

1. For the fall 2018 assessment, 6 artifacts were collected from the MUM 2604C pre-test and 8 from the post-test, accounting for 6 common artifacts between the pre-test and post-test.
2. In a comparison of pre-test to post-test changes in survey responses by question, increases in positive response are visible for all questions and exhibit exceptional growth. Question 5, "Do you know the process to find standing waves and signal cancellation in a monitoring room?" exhibits a growth of 50%, the lowest of any question.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, we see that 31% of all pre-test questions answered were answered with "Disagree," or the most negative response. In the post-test, that percentage is 0%. Similarly, 2% in the pre-test reported "Strongly Agree," or the most positive response. In the post-test, that percentage is 52%.
4. Some slight re-wording of survey prompts and response options is recommended to ensure clarity of the results going forward.

6   REFERENCES

Kuh, G.D., Ikenberry, S.O., Jankowski, N.A., Cain, T.R., Ewell, P.T., Hutchings, P., and Kinzie, J. 2015. Using Evidence of Student Learning to Improve Higher Education. Jossey-Bass. San Francisco, CA. 275pp.