Audio Technology Assessment Report Fall 2020

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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. In Fall 2018, this assessment 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:

- Very familiar
- Knowledgeable
- Somewhat familiar
- Minimal
- None

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.

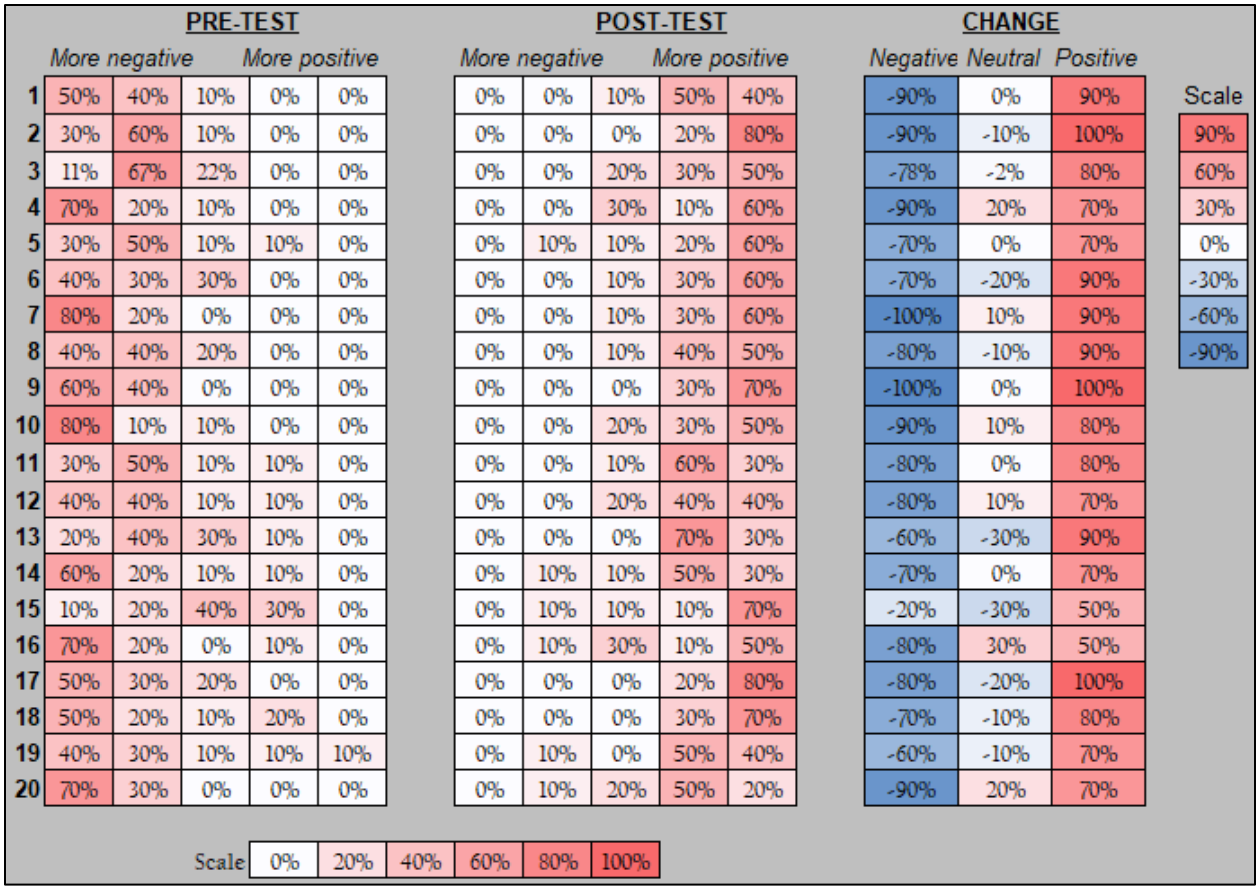
4. Compare and contrast the functions and benefits of various computer software programs used to teach, create, or share music.
5. Describe the role of the internet in the creation and sharing of music.

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 Spring 2021 assessment, 16 artifacts were collected from the MUS 2360 pre-test and 12 from the post-test, accounting for 10 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 15 and 16 exhibits the weakest growth. Question 15 (“Do you understand basic music theory? (pitch, duration, note, and rest values)”) and 16 (“Can you enter notes, lyrics, chords, into a score with a music notation program?”) exhibit only 50% change into a positive response. Most questions exhibit 70% response or higher with several exhibiting 100% positive response.



	PRE-TEST					POST-TEST					CHANGE			
	More negative				More positive	More negative				More positive	Negative	Neutral	Positive	Scale
1	50%	40%	10%	0%	0%	0%	0%	10%	50%	40%	-90%	0%	90%	90%
2	30%	60%	10%	0%	0%	0%	0%	0%	20%	80%	-90%	-10%	100%	60%
3	11%	67%	22%	0%	0%	0%	0%	20%	30%	50%	-78%	-2%	80%	30%
4	70%	20%	10%	0%	0%	0%	0%	30%	10%	60%	-90%	20%	70%	0%
5	30%	50%	10%	10%	0%	0%	10%	10%	20%	60%	-70%	0%	70%	-30%
6	40%	30%	30%	0%	0%	0%	0%	10%	30%	60%	-70%	-20%	90%	-60%
7	80%	20%	0%	0%	0%	0%	0%	10%	30%	60%	-100%	10%	90%	-90%
8	40%	40%	20%	0%	0%	0%	0%	10%	40%	50%	-80%	-10%	90%	
9	60%	40%	0%	0%	0%	0%	0%	0%	30%	70%	-100%	0%	100%	
10	80%	10%	10%	0%	0%	0%	0%	20%	30%	50%	-90%	10%	80%	
11	30%	50%	10%	10%	0%	0%	0%	10%	60%	30%	-80%	0%	80%	
12	40%	40%	10%	10%	0%	0%	0%	20%	40%	40%	-80%	10%	70%	
13	20%	40%	30%	10%	0%	0%	0%	0%	70%	30%	-60%	-30%	90%	
14	60%	20%	10%	10%	0%	0%	10%	10%	50%	30%	-70%	0%	70%	
15	10%	20%	40%	30%	0%	0%	10%	10%	10%	70%	-20%	-30%	50%	
16	70%	20%	0%	10%	0%	0%	10%	30%	10%	50%	-80%	30%	50%	
17	50%	30%	20%	0%	0%	0%	0%	0%	20%	80%	-80%	-20%	100%	
18	50%	20%	10%	20%	0%	0%	0%	0%	30%	70%	-70%	-10%	80%	
19	40%	30%	10%	10%	10%	0%	10%	0%	50%	40%	-60%	-10%	70%	
20	70%	30%	0%	0%	0%	0%	10%	20%	50%	20%	-90%	20%	70%	

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

Figure 1. ***Spring 2021*** *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 "None", "Minimal", "Somewhat familiar", "Knowledgeable", and "Very familiar."*

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 "None" versus those answered "Very familiar." In short, 10 respondents mean a comparison of 200 questions answered (20 questions per respondent). In this comparison, 47% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 1% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 52%.

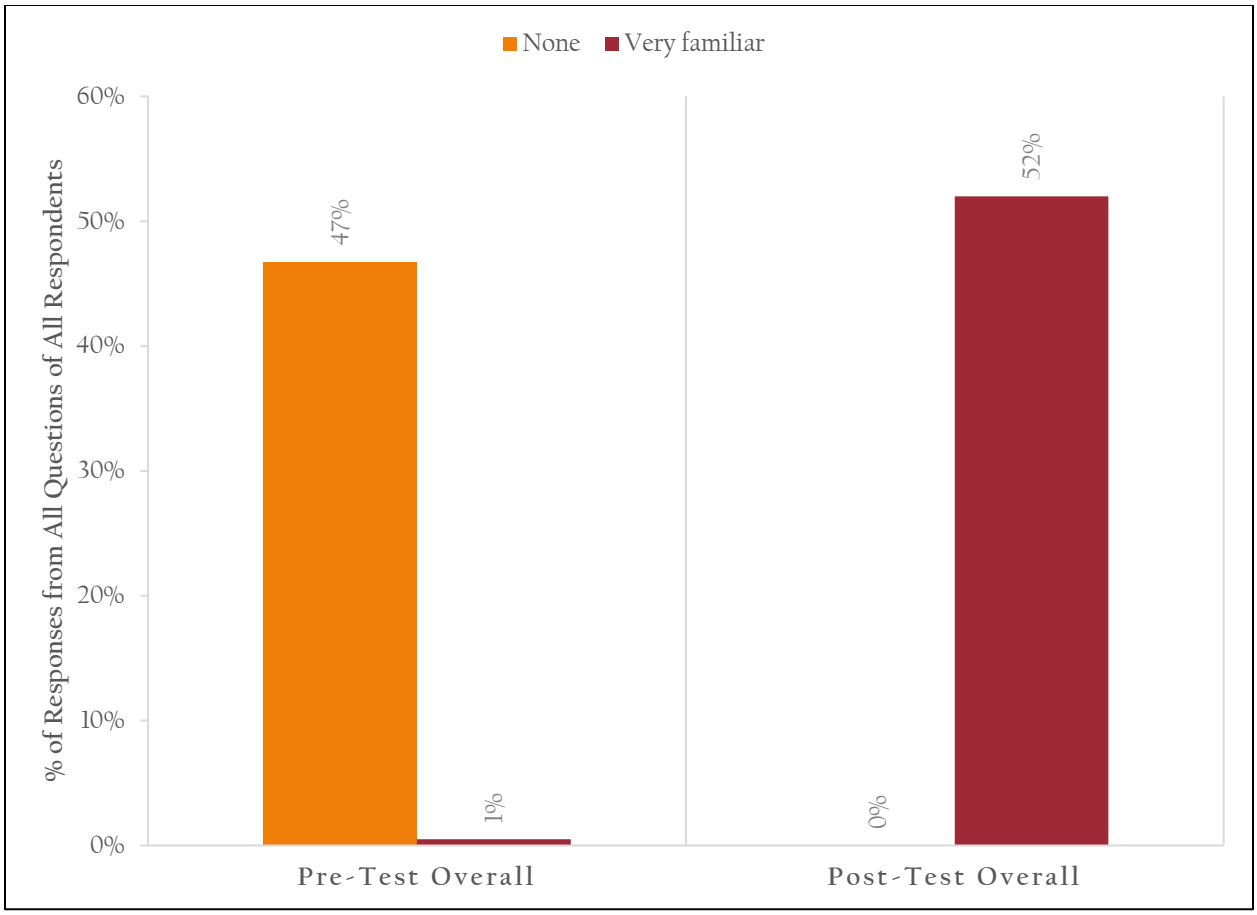


Figure 2. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test.

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:

- Very familiar
- Knowledgeable
- Somewhat familiar
- Minimal
- None

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 & Longitudinal Comparisons

For the Spring 2021 assessment, 10 artifacts were collected from the MUM 2600C 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 3 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Positive growth percentages range from 70% to 100%. The weakest growth is from questions 3 and 10, each at 70%. It is clear from the results of the study that students exhibit limited confidence upon entering the course and then exhibit strong growth.

	PRE-TEST					POST-TEST					CHANGE			
	More negative				*More positive*	*More negative*				*More positive*	*Negative*	*Neutral*	*Positive*	
1	30%	20%	30%	20%	0%	0%	0%	0%	40%	60%	-50%	-30%	80%	Scale
2	30%	20%	30%	20%	0%	0%	0%	0%	0%	100%	-50%	-30%	80%	90%
3	10%	40%	20%	30%	0%	0%	0%	0%	60%	40%	-50%	-20%	70%	60%
4	20%	50%	10%	20%	0%	0%	0%	0%	0%	100%	-70%	-10%	80%	30%
5	30%	50%	10%	10%	0%	0%	0%	0%	40%	60%	-80%	-10%	90%	0%
6	20%	30%	30%	20%	0%	0%	0%	0%	0%	100%	-50%	-30%	80%	-30%
7	20%	50%	10%	20%	0%	0%	0%	0%	0%	100%	-70%	-10%	80%	-60%
8	20%	50%	20%	10%	0%	0%	0%	0%	40%	60%	-70%	-20%	90%	-90%
9	20%	50%	10%	20%	0%	0%	0%	0%	20%	80%	-70%	-10%	80%	
10	30%	10%	30%	10%	20%	0%	0%	0%	0%	100%	-40%	-30%	70%	

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

*Figure 3. **Spring 2021** 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 "None", "Minimal", "Somewhat familiar", "Knowledgeable", and "Very familiar."*

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 “None” versus those answered “Very familiar.” In short, six respondents mean a comparison of 60 questions answered (10 questions per respondent). In this comparison, 23% of all pre-test questions answered were answered with “None” compared with 0% in the post-test. In conjunction with that, 2% of pre-test students reported being “Very familiar” compared with 80% in the post-test.

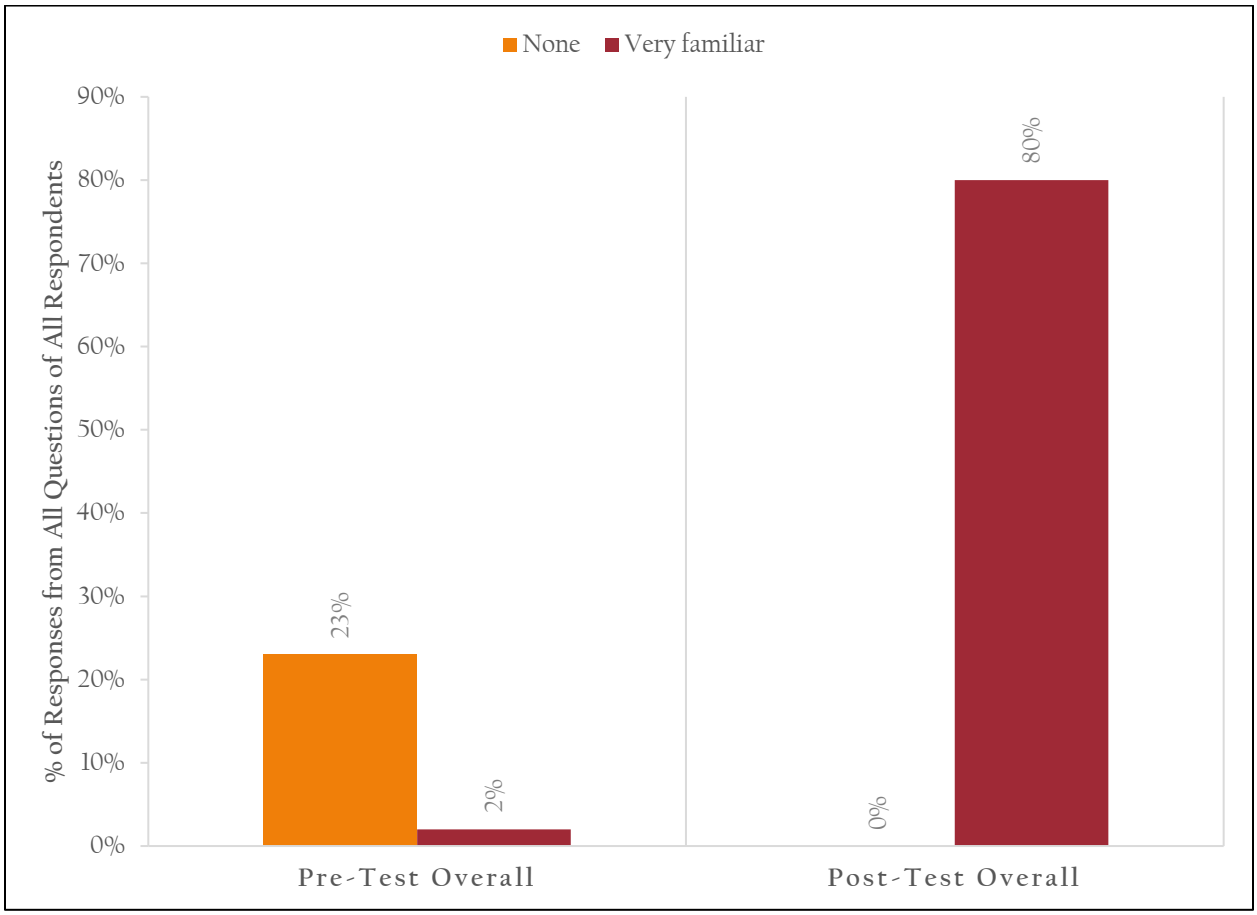


*Figure 4. **Spring 2021** Comparison of percentage of responses from all questions by all respondents reporting "None" or "Very familiar" in Pre-Test and Post-Test.*

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:

- Very familiar
- Knowledgeable
- Somewhat familiar
- Minimal
- None

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 spring 2021 assessment, 3 artifacts were collected from the MUM 2601C pre-test and 3 from the post-test, accounting for 3 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.

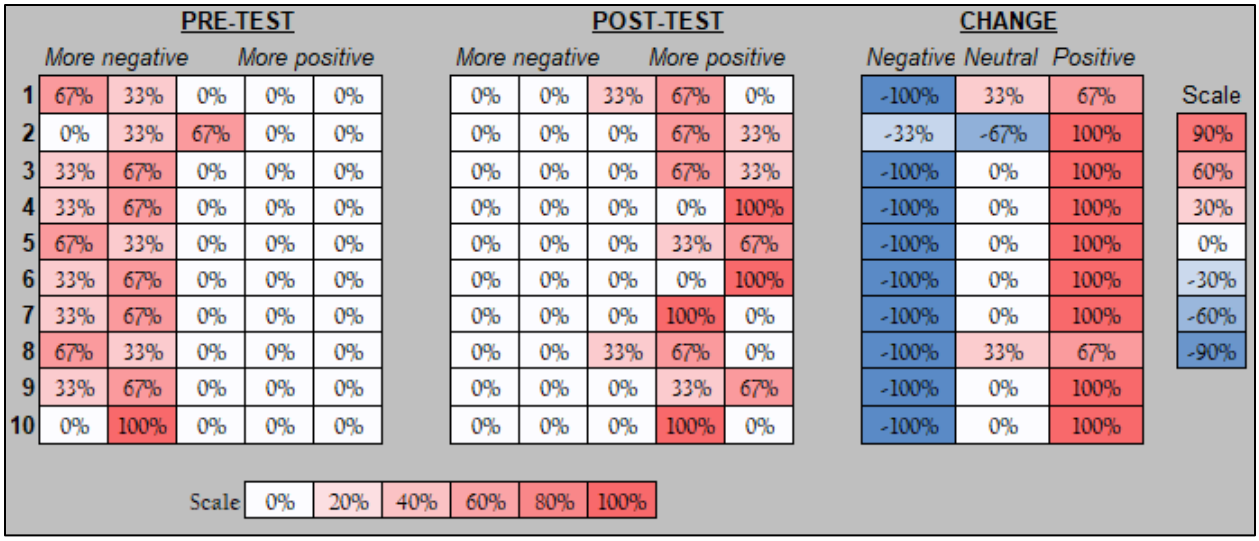


Figure 5. ***Spring 2021*** *Comparison of responses to disposition questions 1-10 based on survey prompt. Questions from left to right (More negative to More positive) reflects the ordinal options "None", "Minimal", "Somewhat familiar", "Knowledgeable", and "Very familiar."*

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 6). 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 "None" versus those answered "Very familiar." In short, three respondents mean a comparison of 30 questions answered (10 questions per respondent). In this comparison, 37% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 0% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 40%.

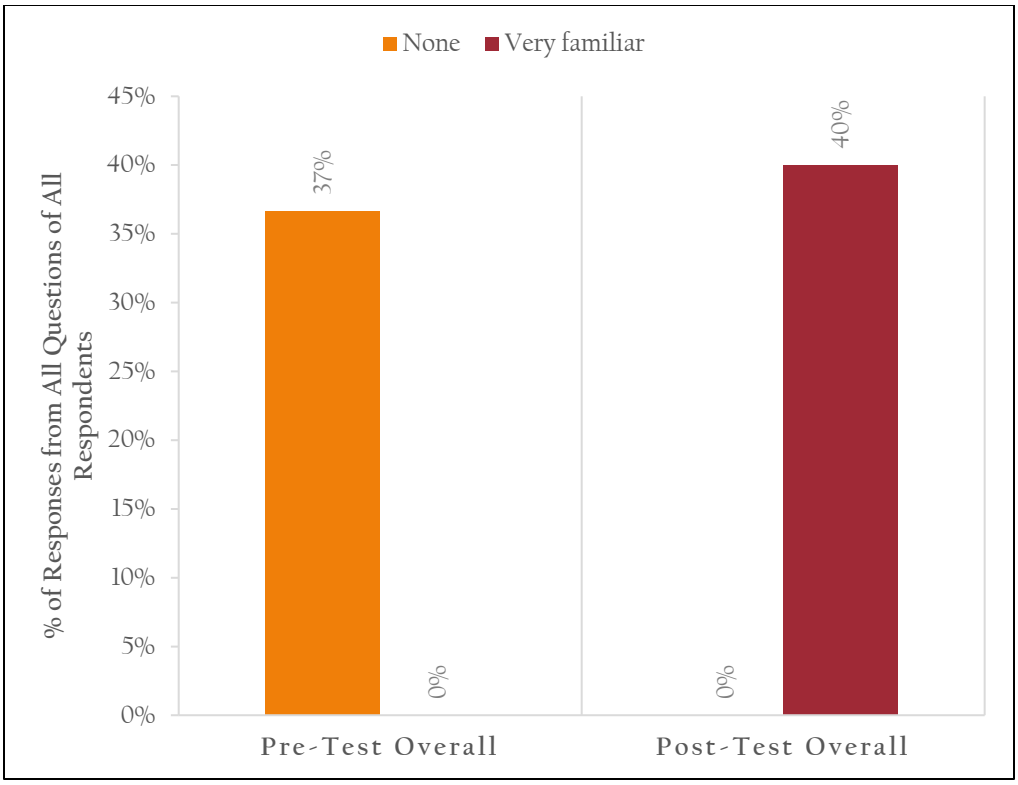


*Figure 6. **Spring 2021** Comparison of percentage of responses from all questions by all respondents reporting "None" or "Very familiar" in Pre-Test and Post-Test.*

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:

- Very familiar
- Knowledgeable
- Somewhat familiar
- Minimal
- None

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 Spring 2021 assessment, 6 artifacts were collected from the MUM 2604C pre-test and 5 from the post-test, accounting for 5 common artifacts between the pre-test and post-test. Results of pre-test and post-test by ordinal response percentage is shown in Figure 7 below. Increases in positive response are visible for all questions and exhibit exceptional growth. Questions 8 and 9 exhibits a growth of only 60% in the positive sense, which is the lowest of any question. All other questions exhibit growth of 80% or higher.

	PRE-TEST					POST-TEST					CHANGE			
	More negative				*More positive*	*More negative*				*More positive*	*Negative*	*Neutral*	*Positive*	Scale
1	80%	20%	0%	0%	0%	0%	0%	20%	20%	60%	-100%	20%	80%	
2	40%	60%	0%	0%	0%	0%	0%	20%	0%	80%	-100%	20%	80%	90%
3	20%	60%	20%	0%	0%	0%	0%	0%	40%	60%	-80%	-20%	100%	60%
4	80%	20%	0%	0%	0%	0%	0%	0%	40%	60%	-100%	0%	100%	30%
5	40%	40%	20%	0%	0%	0%	0%	20%	40%	40%	-80%	0%	80%	0%
6	60%	40%	0%	0%	0%	0%	0%	20%	40%	40%	-100%	20%	80%	-30%
7	60%	20%	20%	0%	0%	0%	0%	20%	0%	80%	-80%	0%	80%	-60%
8	60%	20%	20%	0%	0%	0%	0%	40%	40%	20%	-80%	20%	60%	-90%
9	80%	20%	0%	0%	0%	0%	20%	20%	40%	20%	-80%	20%	60%	
10	80%	20%	0%	0%	0%	0%	0%	0%	40%	60%	-100%	0%	100%	

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

*Figure 7. **Spring 20210** 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 "None", "Minimal", "Somewhat familiar", "Knowledgeable", and "Very familiar."*

Another way of looking at these results is by comparing growth from pre-test to post-test utilizing overall responses (Figure 8). 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 "None" versus those answered, "Very familiar." In short, five respondents mean a comparison of 50 questions answered (10 questions per respondent). In this comparison, 60% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 0% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 52%.

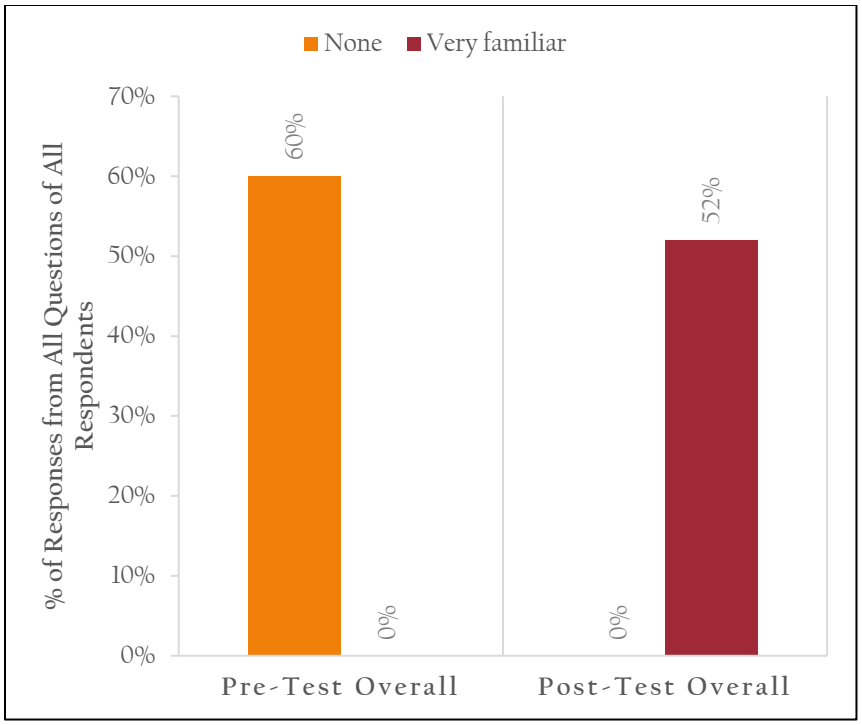


Figure 8. Comparison of percentage of responses from all questions by all respondents reporting "Disagree" or "Strongly Agree" in Pre-Test and Post-Test.

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 18). 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 "None" versus those answered "Very familiar." In short, 33 respondents mean a comparison of 330 questions answered (10 questions per respondent or 20 questions for MUS 2360). In this comparison, 45% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is less than 0%. Similarly, not quite 1% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 55%.

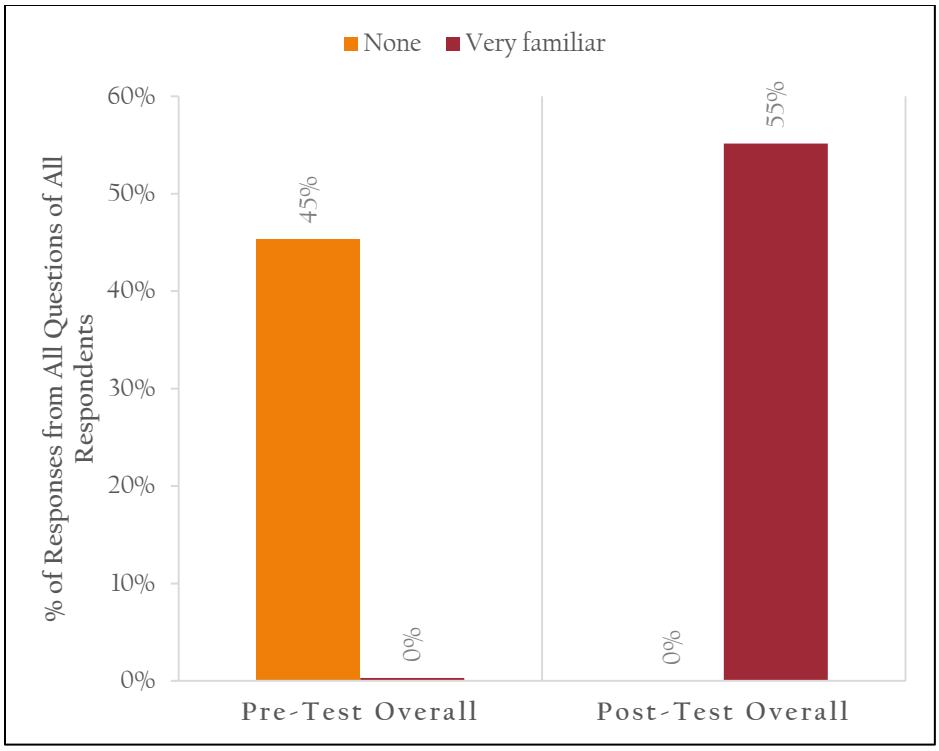


Figure 9. Comparison of percentage of responses from all questions by all respondents across all Audio Technology courses in the assessment plan reporting "None" or "Very familiar" in Pre-Test and Post-Test. For example, 45% reporting "None" in Pre-Test is 45% of 330 responses, the total of the number of students multiplied by the number of questions for each student.

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 MODALITY COMPARISON

Only traditional sections of these 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 expanded from MUM 2601C to the four coursed mentioned

above. For Fall 2019, the assessment likert scale options were modified to more accurately reflect the language of the prompts. 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 Spring 2021 assessment, 16 artifacts were collected from the MUS 2360 pre-test and 12 from the post-test, accounting for 10 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 15 and 16 exhibits the weakest growth. Question 15 ("Do you understand basic music theory? (pitch, duration, note, and rest values)") and 16 ("Can you enter notes, lyrics, chords, into a score with a music notation program?") exhibit only 50% change into a positive response. Most questions exhibit 70% response or higher with several exhibiting 100% positive response.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, 47% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 1% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 52%.

5.2 MUM 2600C

A drilldown of results are as follows:

1. For the Spring 2021 assessment, 10 artifacts were collected from the MUM 2600C 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. Positive growth percentages range from 70% to 100%. The weakest growth is from questions 3 and 10, each at 70%. It is clear from the results of the study that students exhibit limited confidence upon entering the course and then exhibit strong growth.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, 23% of all pre-test questions answered were answered with "None" compared with 0% in the post-test. In conjunction with that, 2% of pre-test students reported being "Very familiar" compared with 80% in the post-test.

5.3 MUM 2601C

A drilldown of results are as follows:

1. For the spring 2021 assessment, 3 artifacts were collected from the MUM 2601C pre-test and 3 from the post-test, accounting for 3 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.
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 "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 0% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 40%.

5.4 MUM 2604C

A drilldown of results are as follows:

1. For the Spring 2021 assessment, 6 artifacts were collected from the MUM 2604C pre-test and 5 from the post-test, accounting for 5 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 8 and 9 exhibits a growth of only 60% in the positive sense, which is the lowest of any question. All other questions exhibit growth of 80% or higher.
3. In a comparison of pre-test to post-test changes in survey responses by overall responses, we see that 60% of all pre-test questions answered were answered with "None," or the most negative response. In the post-test, that percentage is 0%. Similarly, 0% in the pre-test reported "Very familiar," or the most positive response. In the post-test, that percentage is 52%.

6 REFERENCES

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