

What do they know? What can they do?

A pilot study of the knowledge and
experiences of music students in an
introductory music technology course

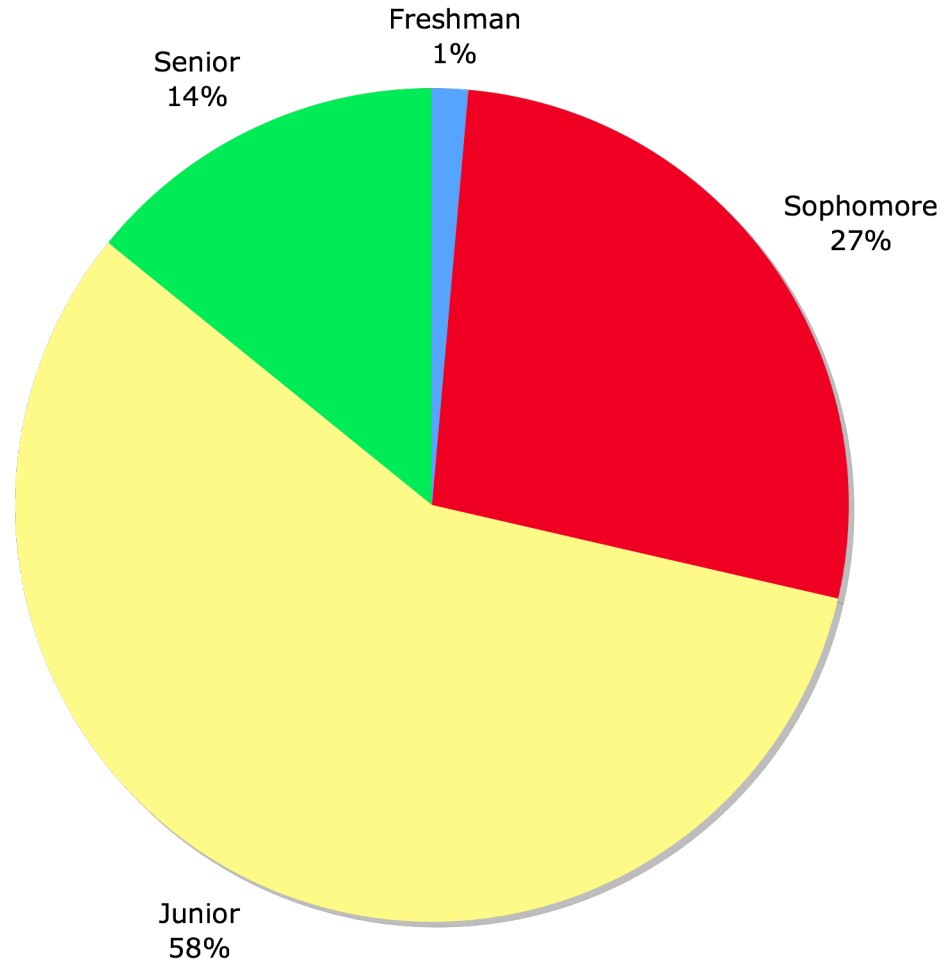
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Presented at ATMI 2011
Richmond, VA

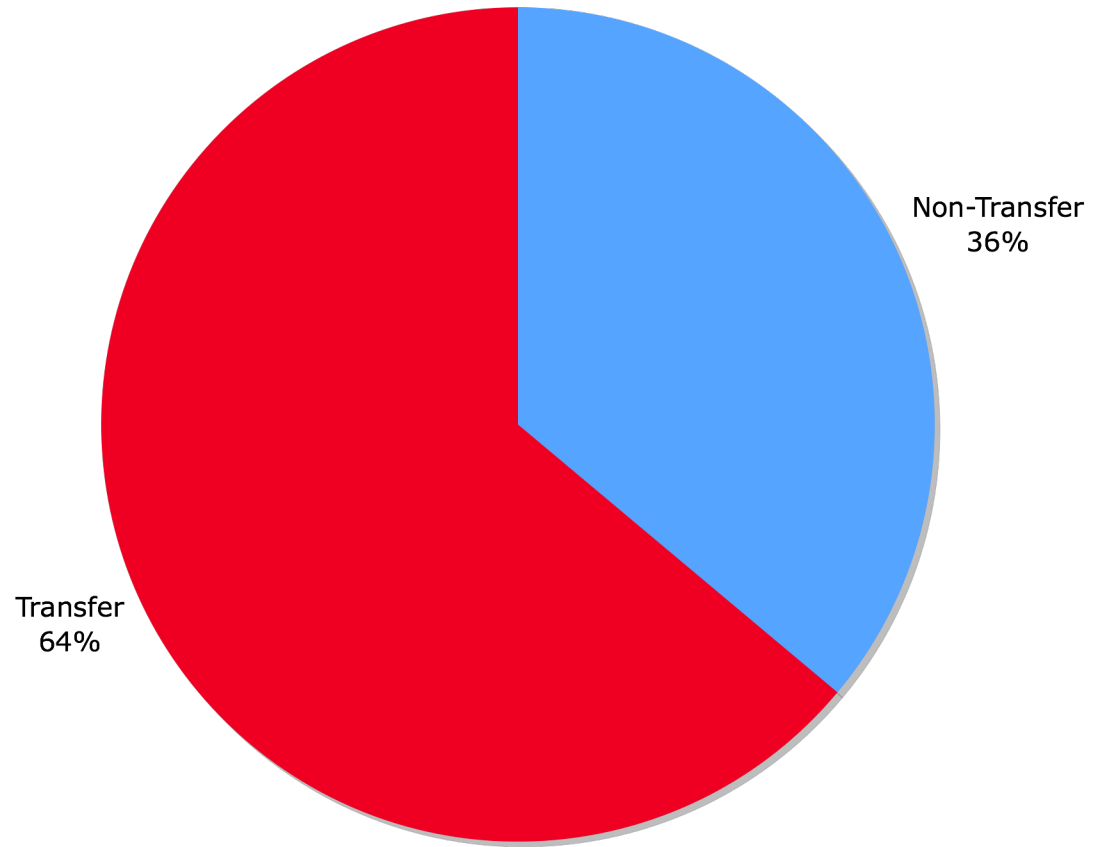
The Setup

- 70 Students in “Fundamentals of Music Technology” at CSUN
- Questionnaire, pt. 1: knowledge self-assessment
- Questionnaire, pt. 2: self-reported experiences
- Pre-Test: 20 questions across a range of topics (part of department Student Learning Outcome assessment process)
- Some demographics...

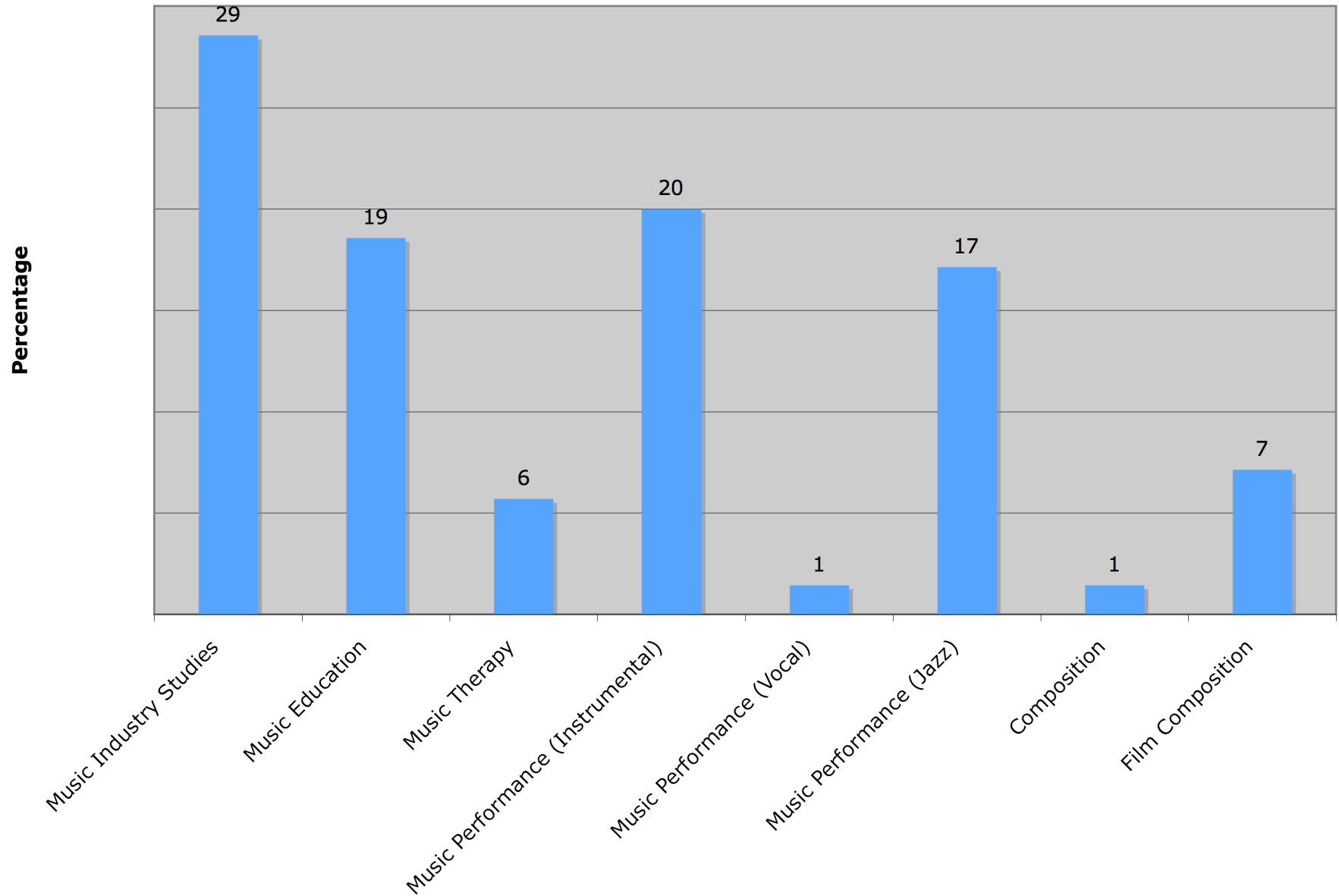
Student Year



Transfer Status



Majors



Knowledge Self-Assessment

[given in percent]

	I am a beginner	I know some	I know a fair amount	I am an expert
Audio hardware	36	42	19	3
Digital audio	50	38	11	1
Audio software	44	27	26	3
MIDI hardware	59	31	10	0
MIDI messages	74	20	6	0
Sequencing software	56	33	10	1
Synthesis techniques	81	16	3	0
Sampling techniques	79	15	6	0
Sampling/synthesis software	74	16	10	0
Computer notation	24	44	31	1
CAI software	27	42	30	1
Multimedia authoring software	64	27	9	0

[Mode in yellow; Higher category above 25% in blue]

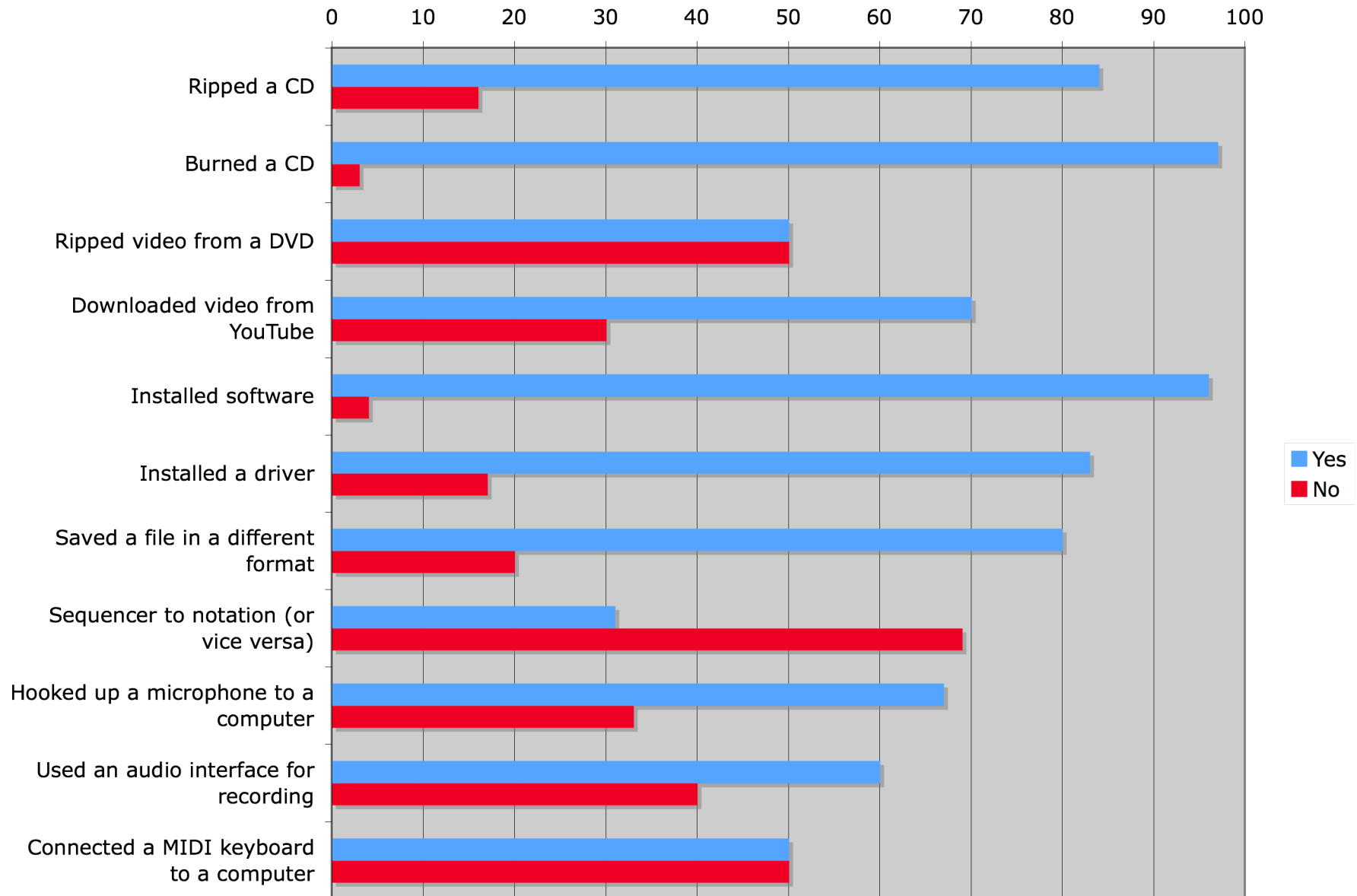
Doing

- Yes/No Responses in 4 categories:
 - General, common tasks
 - Computer notation
 - Sequencing
 - Audio

Doing (General)

	Yes	No
Ripped a CD	84	16
Burned a CD	97	3
Ripped video from a DVD	50	50
Downloaded video from YouTube	70	30
Installed software	96	4
Installed a driver	83	17
Saved a file in a different format	80	20
Sequencer to notation (or vice versa)	31	69
Hooked up a microphone to a computer	67	33
Used an audio interface for recording	60	40
Connected a MIDI keyboard	50	50

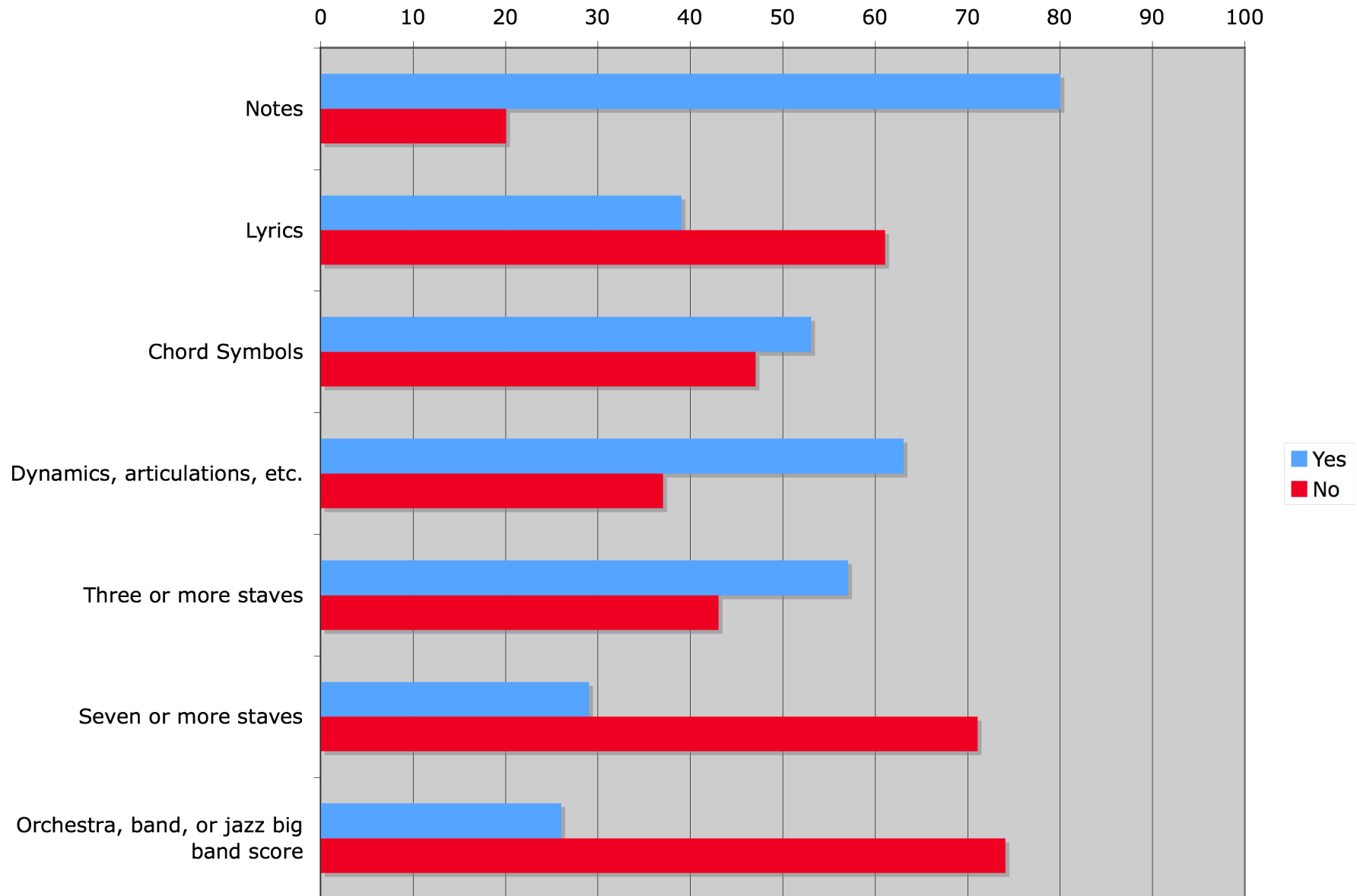
Doing (General)



Doing (Computer Notation)

	Yes	No
Notes	80	20
Lyrics	39	61
Chord Symbols	53	47
Dynamics, articulations, etc.	63	37
Three or more staves	57	43
Seven or more staves	29	71
Orchestra, band, or jazz big band score	26	74

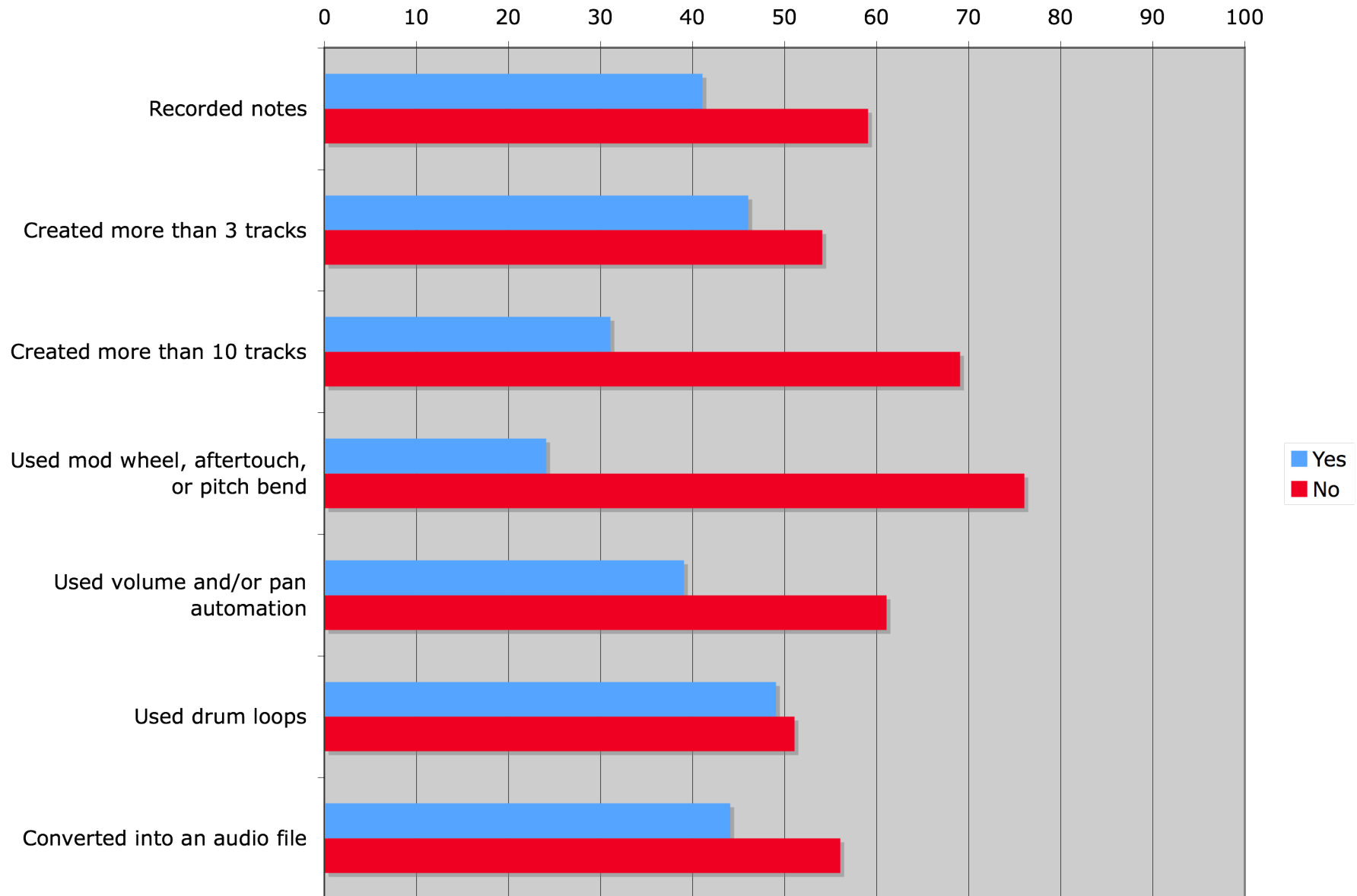
Doing (Computer Notation)



Doing (Sequencing)

	Yes	No
Recorded notes	41	59
Created more than 3 tracks	46	54
Created more than 10 tracks	31	69
Used mod wheel, aftertouch, pitch bend	24	76
Used volume and/or pan automation	39	61
Used drum loops	49	51
Converted into an audio file	44	56

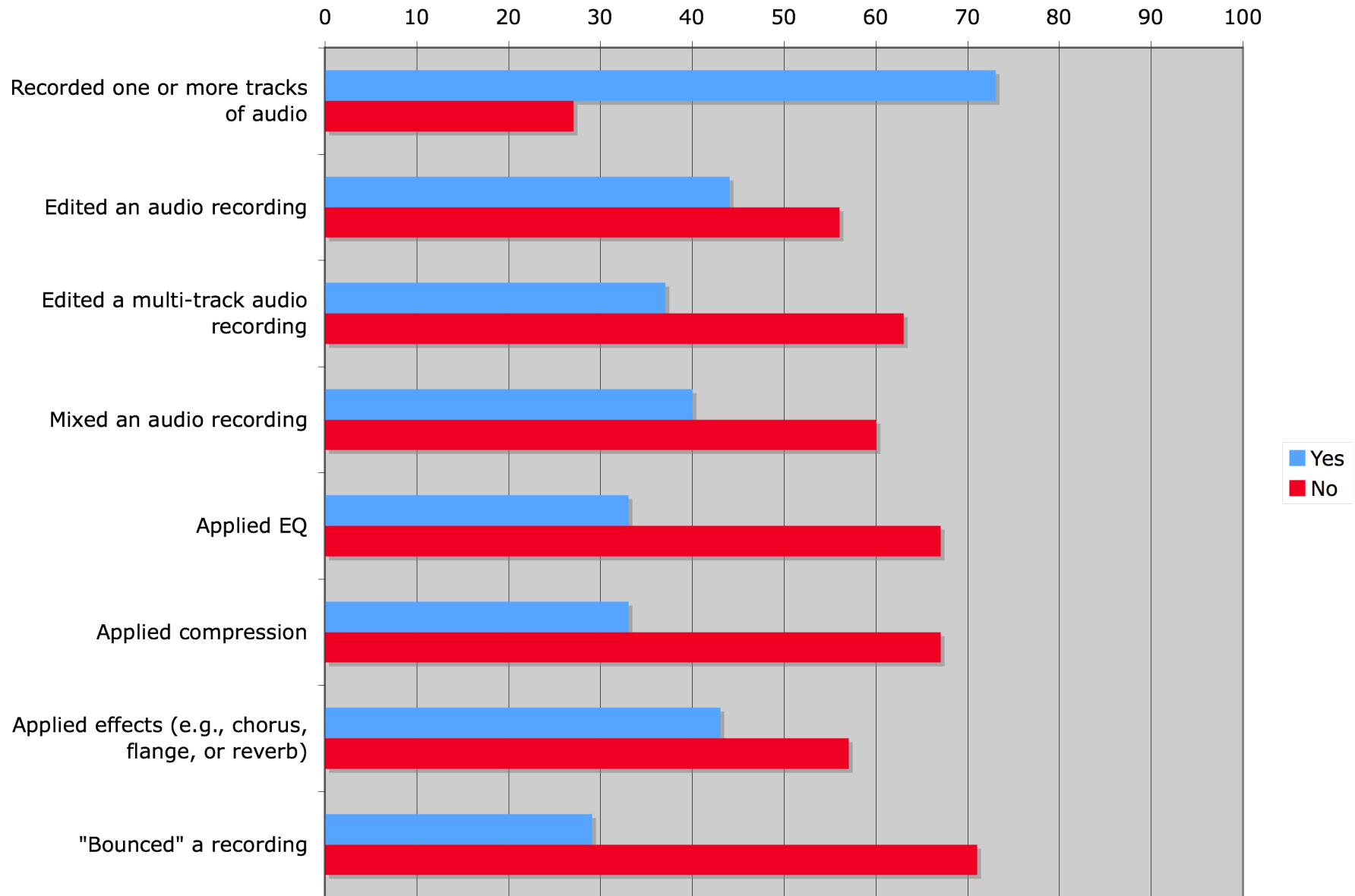
Doing (Sequencing)



Doing (Audio)

	Yes	No
Recorded one or more tracks of audio	73	27
Edited an audio recording	44	56
Edited a multi-track audio recording	37	63
Mixed an audio recording	40	60
Applied EQ	33	67
Applied compression	33	67
Applied other effects	43	57
"Bounced" a recording	29	71

Doing (Audio)



Pre-Test (Audio HW)

Questions relating to audio hardware:

1. Which of the following converts sound waves into electrical signals? (ans: Microphone)
 - level: “some”
 - correct: 41%
2. Which of the following converts a string of numbers representing audio into a continuous electrical signal? (ans. Digital-to-analog converter)
 - level: “some”
 - correct: 37%

Audio Hardware Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
36	42	19	3

Pre-Test (Digital Audio)

Questions relating to digital audio:

3. Which of the following is a compressed audio file? (ans: MP3)
 - level: “some” or less :)
 - correct: 75%
4. What is the CD-quality sampling rate for digital audio? (ans. 44.1 kHz)
 - level: “some”
 - correct: 32%)

Digital Audio Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
50	38	11	1

Pre-Test (Audio SW)

Questions relating to Audio SW:

5. What is the maximum recording level in recording software? (ans: 0 dB FS)
 - level: “fair amount”
 - correct: 14%
6. Which of the following is not a typical plug-in effect in recording software? (ans. Quantization)
 - level: “some”
 - correct: 41%

Audio SW Self Assessment (percentages):



Pre-Test (MIDI HW)

Questions relating to MIDI HW:

7. What is a keyboard called that can generate MIDI messages but doesn't make sound? (ans: controller)
- level: "some"
 - correct: 54%

MIDI HW Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
59	31	10	0

Pre-Test (MIDI Messages)

Questions relating to MIDI Messages:

8. What is the part of a MIDI note-on messages that indicates how quickly a key was pressed? (ans. Velocity)
 - level: “some”
 - correct: 25%
9. Which MIDI message is often used to add vibrato to a sound? (ans. Modulation Wheel)
 - level: “some”
 - correct: 25%
10. What is the standard range for most MIDI values, such as key number or aftertouch value? (ans. 0–127)
 - level “some”
 - correct: 32%

MIDI Messages Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
74	20	6	0

Pre-Test (Sequencing SW)

Questions relating to Sequencing SW:

11. In MIDI Sequencing, what is the process of “correcting” part of a sequence by causing notes to be aligned with a time grid called? (ans. Quantizing)
- level: “some”
 - correct: 60%
12. What is the view called in a sequencer that shows each track as a strip with volume and pan controls? (ans. Mixer Window)
- level: “some”
 - correct: 52%

Sequencing SW Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
56	33	10	1

Pre-Test (Synthesis)

Questions relating to Synthesis:

13. What is the component of an analog-style synthesizer that generates the basic waveform? (ans. Oscillator)
 - level: “some”
 - correct: 63%
14. What is the component of an analog-style synthesizer that creates a note’s articulation? (ans. amplifier/envelope generator)
 - level: “some”
 - correct: 37%
15. Which synthesis technique uses a separate oscillator for each partial (harmonic) in the desired spectrum? (ans. additive synthesis)
 - level “fair amount”
 - correct: 10%

Synthesis Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
81	16	3	0

Pre-Test (Sampling)

Questions relating to Sampling:

16. What is the sampling technique that allows the sampler software to extend the length of a sample? (ans. Looping)
 - level: “some”
 - correct: 78%
17. What is the sampling technique called in which several or many samples are recorded spanning the range of the instrument? (ans. Multisampling)
 - level: “some”
 - correct: 76%
18. What is the sampling technique called in which the sampler software chooses which sample to play based on how quickly the key on a MIDI keyboard was pressed? (ans. velocity switching)
 - level “fair amount”
 - correct: 48%

Sampling Self Assessment (percentages):

I am a beginner	I know some	I know a fair amount	I am an expert
79	15	6	0

Pre-Test (Notation SW)

Questions relating to Notation SW:

19. Which file format is used for transferring files between a notation program and a sequencer? (ans. standard MIDI files)
- level: “some”
 - correct: 67%
20. Which file format is best for transferring a file between notation programs? (ans. MusicXML)
- level: “some”/”fair amount”
 - correct: 21%)

Notation SW Self Assessment (percentages):



Conclusions

- They have done many of the general, common tasks—→can cover nuances rather than basics (if at all)
- Many have experience with notation and audio—→those activities can be more sophisticated and move more quickly
- Tested knowledge is still a mixed bag; need better, longer testing instrument

Plans

- Seek feedback on structure and content of questionnaire from the good people of ATMI
- Enlist other institutions to participate
- Re-do on a regular basis in order to plot trends in knowledge and experiences of incoming college music students

Thank you!

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