



### Introduction

Sound level meters (SLM) are used to determine intensity levels in environments. Applications are being developed as a less expensive way to measure intensity levels, but the accuracy of these apps are limited. A Type 2 SLM can range in price from under \$100 to over \$8,000. Apps using a SLM, range in price from free to \$99 cents and up depending on the type and features.

Knecht, Nelson, Whitelaw, and Feth (2002) looked to determine background noise levels in classrooms to demonstrate if noise levels met the national standards for classroom noise. Results showed that the noise levels ranged from 34.4 dBA to 65.9 dBA.

Burnett, Britten, and Dearden (2008) looked at intensity levels in a university wellness center. Conditions of the intensity levels included: music on, music on/active, and quiet. Sound levels for the music on and quiet conditions showed intensity levels to be acceptable where results showed unacceptable measures during the music on/active condition when not controlled by an administrator.

#### Purpose:

The purpose of this study was to compare sound levels in different environments using a Type 2 Sound Level Meter and five SLM apps on an iPhone 4S.®

### Methodology

Five environments were chosen based on the frequency of use. Measurements were collected in the approximate center of each setting. The Type 2 SLM was calibrated using the calibrator that came with the unit before testing and the five apps used were calibrated when downloaded onto the iPhone.® Table 1 shows the features of each device app.

Environments that were tested included: an unoccupied classroom, a university fitness center, the main floor and lobby of a university library, and a coffee shop and study lounge in a university union. In addition, three common home appliances were measured.

Intensity levels were measured first by the Type 2 SLM followed by the apps. A data sheet was used to determine structures or features of each room that could affect intensity levels. Structures or features included HVAC system noise, carpeted or tile floors, vaulted or leveled ceilings, students, and barriers such as walls.

### Discussion and Conclusion

Most of the apps showed a variance in their ratings within the different environments. The SPL Meter by Studio 6 and dB Volume DSP Mobile showed to be the most reliable in making the closest of all apps to the Type 2 SLM readings, where as the 160 dB SLM HMB-TEC and Decibel 10 by SkyPaw showed to be the most inaccurate based on the number of times these apps ranked farthest from the Type 2 SLM reading.

The apps fluctuated in terms of accuracy to the Type 2 SLM readings for the environments tested. The SPL Meter by Studio 6 and dB Volume DSP Mobile had the most efficient readings for most environments; however, these differences also fell in the middle and lower ranges for a few environments. Room characteristics and environmental factors should also be taken into account for accuracy of the readings.

Price showed to not be a factor for adequacy in the apps; however, the consumer ratings for the apps appeared to be reliable on the validity of the apps. When deciding on an app to download a rating of "4" or higher should be considered.

The impact of knowing the efficiency of these apps for speech language pathology services is having an affordable resource to determine sound levels in areas where services are being provided. SLPs could use these apps to determine if the area they are providing services in has acceptable sound intensity levels.

The SPL Meter by Studio 6 and dB Volume DSP Mobile apps showed to be acceptable for giving approximate intensity levels that were closest to the Type 2 SLM readings.

### Selected References

Burnett, J., Britten, F., & Dearden, L. (2008). Sound intensity levels in a university wellness center. *Recreational Sports Journal*, 32, 11-15.

Knecht, H. A., Nelson, P. B., Whitelaw, G. M., & Feth, L. L. (2002). Background noise levels and reverberation times in unoccupied classrooms: Predictions and measurements. *American Journal of Audiology*, 11, 65-71.

Table 1. Checklist of Features

Features	Type 2 SLM	Decibel 10 by SkyPaw Only "A" Scale	SPL Meter by Studio 6
Frequency Response Calibration	Yes	Yes	Yes
Fast/Slow Response	Yes	Yes	Yes
Range	Yes	Yes	Yes
Max/Minimum Peak	Yes	Yes	Yes
Price	Varies	Free	\$0.99
Rating	N/A	3.5	4
Features	dB Volume by DSP Mobile	Digital Sound Meter	160 dB SLM
Frequency Response Calibration	Yes	No	No
Fast/Slow Response	No	No	No
Range	No	No	No
Max/Minimum Peak	No	Yes	Select Range in Meters
Price	Free	Free	\$1.99
Rating	4	3	2

### Results

Figure 1. Sound Intensity Levels in Environments Tested

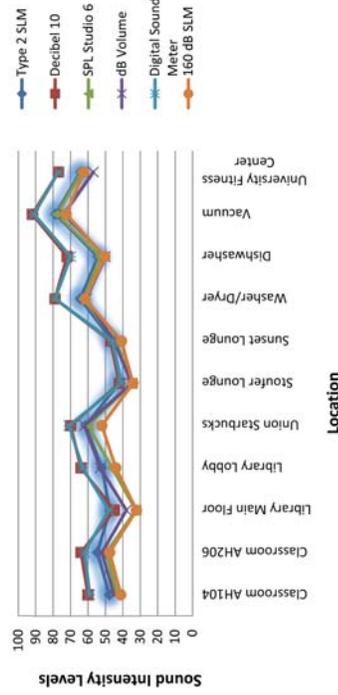


Figure 1 shows the results of the five apps used and the intensity levels within each environment. The Type 2 SLM is graphed in bold to show the comparison of the apps.