The suitability of a singing repertoire for children's vocal range in third-grade music lessons in general education schools

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Summary

Music is a compulsory subject in Estonian general education schools, and one of the main educational goals is to develop children's vocal skills. Music learning starts in kindergarten, and according to the national curriculum (Põhikooli riiklik õppekava, 2011; Gümnaasiumi riiklik õppekava, 2011), music education extends from the first grade to the end of high school. Up to grade 5, students receive 2 hours of music education per week, which amounts to 70 hours per school year. For grades 5 to 12, this is reduced to 1 hour per week or 35 hours per school year.

Estonian schools have a commendable standard of music education, strengthened by well-structured teaching methods. Music education is the responsibility of thoroughly trained professional music teachers. Musical education has a strong cultural significance in Estonia, evidenced in the national and youth song festivals. In addition, students have many opportunities to express their musical talents, such as participation in choirs, orchestras and music Olympiads (Kangron, 2020).

Although singing is a fundamental part of this music education, it is not clear how well matched the child's vocal capabilities are to the vocal demands of the repertoire. A mismatch may exist between the child's vocal ability and the required repertoire. It is important to establish whether a child's vocal range includes all the necessary pitches and how comfortably they can sing them. It is not uncommon for some songs taught in class to be inappropriate for some children. This is because the pitches required to perform the song may be above or below the child's vocal range.

The author of this article aims to empirically investigate and compare the characteristics and variability of primary school children's singing voices. This will be achieved by measuring and analysing their vocal range profiles. In

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addition, the study aims to assess how well the repertoire in current music textbooks matches these voice profiles.

Research questions

1. What is a typical Voice Range Profile (VRP) for a third-grade student, and how variable are these profiles? The VRP illustrates both the pitch and dynamic range for all the notes a voice can produce.
2. In what is the most comfortable pitch and dynamic range for children to sing?
3. How likely is it that some of the songs in a music lesson are not suitable for some children because of their vocal characteristics?

Method

The study involves measuring the Voice Range Profile (VRP) of third-grade students and comparing it with the tessiturograms of the repertoire found in music textbooks.

The VRP technique, which has been used in voice research since 1970, is primarily used to help diagnose voice disorders. The Voice Range Profile is a format for presenting a summary of voice data in a single image, which has a horizontal axis for the fundamental frequency in semitones and a vertical axis for the sound pressure level in decibels. The company Alphatron Medical Systems has developed the Voice Profiler. The headset contains two microphones, one close and one at 30 cm.

The tessiturogram provides a graphical representation of the frequency of notes within individual compositions. This innovative method, developed by the phoniatric-otolaryngologist Stefan Thürmer, assesses the vocal suitability of specific repertoires. For this study, tessiturograms were created for songs listed in textbooks tailored to the target age group. There is a total of five music textbooks in use: two in Russian (2002, 2013, by Maia Muldma) and three in Estonian (2008, 2013, by Monika Pullerits and Liivi Urbel; 2012, by Kai Anier and Maia Muldma). In order to achieve this, all five existing third-grade songbooks were analysed.

The repertoire consists mainly of songs written in the absolute system, which are learned by ear in a musical setting provided by the composer. The vocal works should be composed in a manner that is suitable for children's vocal range.

VRP measurements were obtained from third-grade students who had begun their musical journey in the first grade, had achieved an appropriate level of voice control and had not yet experienced vocal fold changes. In total,

41 children between eight and ten years old participated, with an average age of 9 years and three months (SD 4.1).

The participants were divided into two groups according to gender: 21 boys and 20 girls. For the purpose of presenting the results, the sample was then divided into two groups: those who had experienced music outside general music education and those who had not.

Results

The mean VRP for a normal third-grade student was 27.1 ST. Notably, there was significant variation in vocal ranges, with the widest range being 37 ST and the narrowest being 16 ST, a difference of 21 ST. Among the participants, nine children (22%) had a range above 30 ST, all of whom were members of different choirs. Conversely, two students (5%) who had not participated in any musical activities other than general music education displayed a range of less than 21 ST. Research indicates that there was a correlation between musical participation and vocal range. Out of the 41 third graders, 26 participated in music as an after-school activity, while the remaining 15 did not.

Among boys, those who participated in musical activities had an average VRP of 28.7 ST, while those who did not participate had an average VRP of 22.8 ST. For girls, the mean VRP was 29 ST and 26 ST for involved and non-involved, respectively. The widest vocal range among girls involved in music was 34 ST, and among boys, 37 ST. For those not involved in music, the mean VRP was 28 ST for boys and 29 ST for girls.

Given the average dynamic range of each note (a minimum of 20 dB), a comfortable range for singing was found to be *h*–f^2. Within this comfortable range, a large number of songs in the five evaluated textbooks are suitable. The tessituras of several songs were in this range. Moreover, many songs with incompatible tessituras could be transposed (changing the tonality higher or lower) to make them suitable.

Songs with the tessitura *h*–f^2 were perfectly suited to 18 of the 41 participating children. For a further 16, this range was almost acceptable, with the exception of a few pitches. The number of suitable songs was limited to seven children, and none of the songs analysed were suited to one participant. It is difficult for them to find a repertoire of songs written in the absolute system, but songs written in the relative system and learning songs with a small singing range are certainly suitable and developmental for them.

Conclusion

In Estonia, contemporary music textbooks for the third grade offer a wide variety of songs suitable for most students. However, there are still cases where students' vocal ranges do not match the pitch ranges of certain songs. By understanding their students' VRP, teachers can make more informed choices when selecting repertoire.

Keywords: child's voice, voice range profile, tessitura, third-grade music textbooks, song repertoire