Making Music a Colourful Experience: Exploring the Impact of Colour-Coded Stave Notation on Young Children's Confidence and Accuracy When Reading Music.

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Introduction

The formative years of learning to play an instrument are crucial to fostering a love of music education in children **(Mills & McPherson, 2006; Voima, 2009)**. Music-reading has been shown to be one of many valuable tools that allow beginner musicians to develop independence whereby the notation signposts what notes to play **(Hultberg, 2002; Troyka, 2004; Wiggins, 2000).** Ability to read monochrome notation is a UK National Curriculum requirement **(Department of Education, 2013);** however, developing confidence and fluency has many challenges for educators and learners alike **(Mills & McPherson, 2006; Schenck, 1989).** It is thus important to ensure that these challenges do not negatively impact a child's motivation to make and perform music **(Cogdill, 2015; Hallam, 2010).**

Benefits of Reading Music

- Guides "from vision to audition" **(Kuo & Chuang, 2013, p.395**);
- Can improve accuracy of performance by clearly signposting what needs to be played, thus reducing the likelihood of errors caused by insufficient memorisation **(Grier, 2021);**
- Can contribute to deeper understanding of the structure and composition of the piece **(Leech-Wilkinson, 2012; Palmer, 1997);**
- Influences the development of musical independence **(Nolet, 2007);**
- Transferable holistic advantages, such as enhanced cognitive abilities and improved neurological function **(Stewart et al., 2003; Stewart & Williamon, 2008);**
- Can positively impact academic progress through development of literacy skills **(Bettany & Brooks, 2015; Butzlaff, 2000; Hallam, 2019).**

Negatives Associations with Reading Music

- Musical performance can be different each time based on the musicians' interpretation of the score **(Leech-Wilkinson, 2012);**
- An unnecessary obstacle as the skill of learning to read music is separate from the skill of playing an instrument **(Hubicki & Miles, 1991; Kuo & Chuang, 2013);**
- Can contribute to cognitive overload **(Gooding & Standley, 2011);**
- Performance might not sound overtly 'musical' **(Sloboda, 1978)** on the basis that each pitch is performed slowly and in turn without flow or fluency **(Voima, 2009; McPherson & Gabrielsson, 2002; McPherson & Renwick, 2001).**

Benefits of Colour-Coding

- Colour may help distinguish between different notes **(Kuo & Chuang, 2013)** by making important information stand out **(Carlin, 2015; Wolfe et al., 2007);**
- The likelihood of cognitive processing errors diminishes because less information is required to be processed at one time **(Kristjánsson et al., 2002; Schneider & Shiffrin, 1987; Wolfe et al., 1989).**

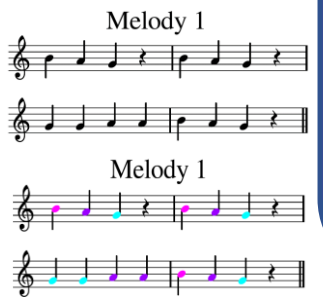
The Study

This study investigated whether learning to read musical stave notation using a cross-modal association of colour-coded note heads for pitch enhanced beginners' accuracy and confidence when reading simple 4-bar single-line melodies on a one octave metallophone. The study used a pre-test, training, post-test model with 40 beginner musicians from year two (ages six to seven) in a single London primary school. Participants were assigned to experimental or control groups for three teaching sessions. All resources were identical in each session. However, for the experimental group, each pitch on the stave was colour-coded to reflect the same colours of the instrument keys, compared to the control group learning traditional monochrome notation. All participants were tested pre- and post-training on their self-reported levels of confidence when reading formal stave notation in both colour and monochrome, as well as a quantitative test of music-reading accuracy in both mediums. Qualitative data from semi-structured interviews with children and teachers was analysed using thematic analysis to support the quantitative findings.

Major Findings

Colour-coded notation appeared to be effective in facilitating improved accuracy when reading unfamiliar melodies. However, this appeared to be due to matching colours and did not suggest any level of transferability to the future reading of monochrome notation. Colour-coded notation was, however, deemed easier by 97.5% of participants and preferred by 77.5%, leading to the suggestion that there is a place for it in the primary school music curriculum as a method of boosting children's self-confidence, independence, enjoyment and motivation towards music as a subject before learning formal monochrome notation.

Colour-coded notation...	*Monochrome notation...*
is easy	is difficult
sounds like real music	doesn't sound like real music
is fun	is frustrating and tedious
is visually stimulating	looks boring



Implications

Colour-coded notation could:

- Be introduced as a pre-step to build motivation before learning formal stave notation;
- Likewise, support generalist teachers to confidently deliver lessons using notation;
- Improve motivation based on easier successes and more 'musical' output;
- Foster development of independent learners.

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