

Collective free improvisation in the Flemish general music classroom: Probing student's lived experience through flow

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Abstract

The aim of this study is to explore the lived experience of students ($N=1,282$) in general education engaging in collective free improvisation (CFI). Fourteen music teachers implemented a CFI lesson in 69 classes in Flanders (Belgium). Lived experience was measured using a Dutch version of the Flow State Scale for Occupational Tasks. This scale reflects the degree of *Sense of Control*, *Positive Emotional Experience* and *Absorption by Concentrating*. In addition, teachers' reflections were mapped by means of an online survey. Overall scores on the 3 dimensions of the Flow scale averaged greater than or equal to 5 (7-point Likert scale). Results show a difference in total flow between students who already played an instrument and those who did not. Students who play an instrument score significantly higher on the factor 'Sense of Control'. Conversely, the flow scores on the factors 'Absorption by Concentration' and 'Positive Emotional Experience' do not differ between instrumentalists and non-instrumentalists. Given the relatively high flow scores, we conclude that this type of musical engagement can be used for instrumentalists as well as non-instrumentalists. Although CFI was a new experience for the teachers, they indicated to continue using it in the future.

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Keywords

Collective free improvisation, flow, general music education, inclusive music education, lived experience

Introduction

It is generally accepted that musical improvisation is an important form of musical creativity and an important educational tool to promote musical learning (Hickey, 2009; MacDonald & Wilson, 2020; Sawyer, 2006; Sušić et al., 2019). However, despite this common acceptance, there still seems to be little room for improvisation in music education, which often adheres to a rather traditional approach, according to the conventions of the Western music tradition (Stijnen et al., 2024). In instrumental music education, this might be due to a lack of time and training in musical creativity (Siljamäki & Kanellopoulos, 2019; Stijnen et al., 2024). In general education, research shows that teachers in general education are often reluctant to use improvisation due to a lack of experience and fear of reduced classroom discipline (Coulson & Burke, 2013; Larsson & Georgii-Hemming, 2019). Hence, positive learning experiences through musical improvisation in general education can still use an extra boost. Larsson and Georgii-Hemming (2019) emphasize the necessity for studies on improvisation, particularly free improvisation, in an overview of the research studies on improvisation in general education. They conclude that ‘there are only a few empirical studies which look directly at improvisation and none of them deals with improvisation in secondary school’ (p. 63). We conducted a large-scale study ($N=1,282$) to explore the lived experience of first and second year secondary school students and their teachers ($N=14$) when engaging in collective free improvisation. For this purpose, we designed a lesson sheet containing free improvisation exercises to instruct the teachers involved.

Background*Music education in Flanders (Belgium)*

Flanders has a strong educational system of so-called ‘part-time arts education’, the schools of which reside outside general education and provide a form of additional (voluntary) education for children and adults. Music schools in this network offer instrument tuition, solfège and ensemble playing. Despite the strong growth of these music schools, the number of students reached is still rather low. In 2020 to 2021, approximately 16% of Flemish youth were enrolled in this part-time music education (De Baets & Vanvolsem, 2021). Given this limited participation, it remains important to offer music education in secondary schools (general education). After all, for many children, general education is the only place where they encounter arts, music, and culture (European Music Council, 2018; Verneert, 2021).

Secondary schools (age 12–18) in Flanders currently offer a 1-hr weekly music course in the first and second year, conceptualized as a general course about music without focused instrument tuition. It has no structural follow-up in the following years. Conversely, as of 2022, general (secondary) education (age 12–18) in Flanders is undergoing major reforms, including a set of new learning outcomes. One of these key competencies is ‘cultural awareness and cultural expression’ with a focus on aesthetic experience, experimentation and personal creation in the arts. With the inclusion of the arts as a key competence in general education, the government aims to not only develop competencies such as understanding and respect for the way ideas and meanings are creatively expressed but also contribute to personal, social and mental development.

Collective free improvisation

Musical improvisation has great potential for achieving the aforementioned competencies in general education. Research clearly shows that improvisation has a positive impact on both musical and social development (Azzara, 2002; Burnard, 2002; Chandler, 2018; Kanellopoulos & Wright, 2012; Rabinowitch et al., 2013; Sawyer, 2008). Yet, as Larsson and Georgii-Hemming (2019) state in their literature review, ‘improvisation generally is fairly neglected in general music education’ (p. 64). Moreover, several researchers (see Larsson & Georgii-Hemming, 2019 for an overview) have emphasized the need for more free and open approaches to improvisation in general music education which offer a potential way to create a more inclusive and egalitarian form of music making. In recent research (see Ng, 2021), the term collective free improvisation (CFI) is increasingly being used to describe ‘[. . .] a musical phenomenon produced by at least two persons improvising simultaneously and freely, that is trying to leave undecided every compositional aspect until the very moment of the performance’ (Canonne & Garnier, 2011, p. 1). The idea of CFI centres on the joint creation of meaning through both verbal and nonverbal communication (Monk, 2013). It also encompasses the examination of interpersonal dynamics and the communicative elements inherent in collaborative musical processes (Beegle, 2010; Burnard, 2002). According to Nachmanovitch (1990), free improvisation encompasses various components such as exploration, playing around, chaos, sound focus and interaction. The approach is characterized by its lack of adherence to conventional (musical) norms and its emphasis on originality, with the aim of encouraging an exploratory and experimental mindset. Imagination, group action, silence as a powerful tool, inappropriate instrument use and dynamic changes are emphasized (Burnard & Dragovic, 2015; Corbett, 2016; Nachmanovitch, 1990). The practice of engaging in CFI has been found to have positive effects on social competence, creative thinking and improved musical flexibility, as supported by studies conducted by Koutsoupidou and Hargreaves (2009) and Ng (2021).

As every child takes music classes in general education, we deem it important to reflect on the experiences of students and teachers with regard to collective free improvisation (CFI) in the general classroom. The use of improvisation in the classroom can lead to positive social outcomes and learning experiences such as risk-taking, exploration, agency and participation (Edmund & Keller, 2020; Higgings & Mantie, 2013), as well as the development of abilities for thinking *out-of-the-box* and adaptation to our changing society (Verneert et al., 2021).

Flow

Given the importance of positive experiences for music learning (Alerby & Ferm, 2005), we choose the flow concept, conceptualized as an optimal experience, to assess the lived experience of the students. It is commonly accepted that flow (Csikszentmihalyi, 1990) is a phenomenological condition of intense attention, total immersion in an activity, with emotions of joy and engagement. It is a highly motivational experience that is linked to life satisfaction, effective coping, and creativity (Biasutti, 2017; MacDonald & Wilson, 2020).

Over the last 25 years, scholarly interest in flow has gradually increased within the field of music and music education (Habe & Biasutti, 2023; Tan & Sin, 2021). In addition to the subjective experience of flow at an individual level, research has demonstrated that engaging in collaborative music-making has an influence on the presence of flow (Chirico et al., 2015; Habe & Biasutti, 2023). Csikszentmihalyi (1990) conceptualized flow into a nine items model (*challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, total concentration, sense of control, loss of self-consciousness, transformation of time and autotelic experience*). Based on their review study, Norsworthy et al. (2021) recently presented a general model

Table 1. Age range of the participants.

Age	N	Percent
11	4	0.3
12	379	29
13	604	47
14	268	21
15	24	2
16	3	0.2

identifying the core experiential dimensions of flow as *absorption*, *effort-less control* and *intrinsic reward*. As improvisation requires a sense of control over one's voice, body or instrument, being absorbed by concentration is important for natural play and intrinsic reward through the experience of positive emotions can be a motivation for playing music, we deem these three factors important to grasp the lived experience of students during an improvisational task. Furthermore, the three core flow dimensions align with the three factors we use in our Flow scale.

Method

Objective of the study

Today, still little is known about how students in general education experience active music making and especially improvisation. In this study, we therefore focused on the lived experience of students engaging in a specific form of music-making, namely CFI. This study focused on the following questions: How do students in general education experience a learning activity involving collective free improvisation? Is there a difference in flow experience between instrumentalists and non-instrumentalists? What are the experiences of their teachers?

Participants

A total of 1,372 students participated in our study. Lessons were conducted by 14 music teachers across 69 classes. The average class size was 22 students. The schools were equally distributed across the Flanders region. Only fully completed questionnaires ($N=1,282$) were included in the analysis. The mean age of the participants was 13 years ($SD=0.78$) with a range from 11 to 16 years (Table 1) and comprised 60.5% females and 39.5% males. After having received written information about the project, teachers confirmed their participation and signed a privacy statement. Next, their students received information about the study, with a possibility to opt-out, and informed consent of the students and their parents was obtained.

Little over one fifth (23%) of the participants ($n=296$) played an instrument. Within the group that played instruments, 63% took lessons at a music school (Table 2). The most frequently played instruments were keyboard instruments (36% piano, keyboard) and string instruments (34% guitar, violin).

Research tools

Students' flow was measured using the Flow State Scale for Occupational Tasks (Yoshida et al., 2013, see Appendix 1). Yoshida and colleagues developed a 14-item scale (7-point Likert) that

Table 2. Play instrument – Follow music lessons.

Play instrument	Frequency	Percent	Follow lessons	Frequency	Percent
Yes	296	23	Yes	186	63
No	986	77	No	110	37
Total	1,282	100	Total	296	100

reflects the (individual) degree of flow on 3 dimensions: *Sense of Control*, *Absorption by Concentrating* and *Positive Emotional Experience*.

The ‘sense of control’ dimension consists of six items (e.g. *I was aware of how well I was doing the task*) and refers to the extent of control experienced while performing a task. The ‘positive emotional experience’ dimension consists of four items (e.g. *The exercise was very enjoyable*) and denotes the presence of feelings of joy and the lack of negative affect. The third dimension, ‘absorption by concentrating’ (e.g. *I was completely absorbed in the task*) consists of four items and highlights the importance of task-oriented concentration. Furthermore, it is the extent to which a person is completely absorbed in a task, and is focused on what he is doing,

We translated and adapted the original Flow Scale for Occupational Tasks (Yoshida et al., 2013) for Dutch native speakers. First, three researchers separately translated the items. Translations were merged into a final translation that was reviewed by two English language teachers. The reliability of the translated scale was verified using Cronbach’s alpha coefficient to measure the internal consistency of the scale. The Cronbach’s alpha coefficient of the full scale was $\alpha = .810$ (14 items), which indicated the reliability of the scale. For the three separate factors, the Cronbach’s alpha coefficients were as follows: ‘sense of control’ (6 items), $\alpha = .838$; ‘absorption by concentration’ (4 items), $\alpha = .736$ and ‘positive emotional experience’ (4 items), $\alpha = .837$. The results are aligned with the reliability scores of the original scale (Yoshida et al., 2013). The scale was administered to the students upon the conclusion of the lesson. It was completed within a time frame of 5 to 10 min. In addition to the Flow instrument for the students, participating teachers ($N = 14$) were asked about their experiences using an online survey with seven open-ended questions (see Appendix 2). The online survey was distributed to the teachers individually and completed within 2 weeks after the lesson. The aim was to probe how they experienced the provided lesson, allowing them to formulate their own reflections and comments on the use of improvisation in general music education.

To ensure the accurate completion of the musical task, we requested the teachers to record the lesson (audio and video). We concluded that the lesson was conducted in accordance with the instructions. These recordings were not taken into consideration for further analysis. The interview data were analyzed using a Thematic Analysis approach (Clarke & Braun, 2017). Although the main focus of our research is flow measurement and the lived experience of the students, we felt it was also important to grasp the experiences of teachers in limited terms.

Lesson outline

A lesson consisting of collective free improvisational tasks was provided in the first and second year of secondary education (69 classes) in Flanders. The general idea of the lesson was to initiate CFI through a clear assignment and the use of constraints, giving students the opportunity to experiment freely and express themselves musically without fear of making mistakes. Free improvisation, in this context, means that no rules are in place regarding musical parameters such as tonality, metric or harmonic obligations. Conversely, the use of task constraints (such as visual and verbal

Table 3. Results flow scale (overall scores per dimension).

Flow scores	Valid	Mean	Median	Mode	SD
Total flow	1282	5.041	5.142	5.50	1.10
Absorption	1282	5.125	5.250	6.00	1.26
Posemotex	1282	5.033	5.250	6.00	1.36
Senseofcont	1282	4.992	5.166	5.33	1.08

stimuli and the use of guided dynamics) is not a limitation of freedom or creativity but rather a guiding principle to scaffold the free improvisations. As the improvisations are performed with the whole group, the manipulation of the constraints is used to guide the improvisation and initiate collaborative playing.

The lesson sheet ‘Making Music Out of Strange Sounds’ (Appendix 3) was written out in detail. It outlines the class situation, the material, the course of the lesson and instructions for the teacher. The lesson was taught by different teachers in their respective classes. In preparation, a short explanatory video was made to brief the teachers and clarify the setup and approach. The lesson starts by freely improvising with a musical instrument, voice or body percussion with volume being the only constraint. Students were asked, while playing quietly on their instrument, to look around and consciously listen to the instrument they were looking at, thus shifting their visual and auditory focus and initiating a non-verbal interaction with the group. After this ‘warm up’, the use of dynamics was introduced; here, the students were asked to collectively play their instruments louder or more quietly based on numbers ranging from 1 to 8, representing a gradual increase in volume by the teacher or a student. Next, a ‘loop groove’ was set up to familiarize students with a continuous musical form and introduce a ‘call and response’ exercise. The groove was played using a drum loop at a relatively slow tempo (70 bpm). The final part of the lesson consisted of a collective musical improvisation based on pictures and text (see Appendix 3 for a more detailed description).

Results

Flow results

Table 3 displays the average scores on the translated Flow Scale for Occupational Tasks that was used in this study. Total flow averaged 5.041, the mean score for the dimension Absorption by Concentrating was 5.12; for Positive Emotional Experience 5.03 and for Sense of Control 4.99. Figure 1 shows graphical representations of the three dimensions. We determined the percentage of students with a score of 5 or higher on a 7-point Likert scale. We considered such scores to be a positive result. For Absorption by Concentrating, 63% of students scored 5 or higher, while for Positive Emotional Experience 58.5% and for the dimension Sense of Control, 57.6% of all students scored 5 or higher.

We compared the flow scores for the group of students who plays an instrument (PI) and the group of students who do not play an instrument (NI) (Table 4). There was homogeneity of variances for the scores for both groups, as assessed by Levene’s test for equality of variances (‘sense of control’ $p = .10$, ‘absorption by concentration’ $p = .32$, ‘positive emotional experience’ $p = .50$ and total flow $p = .49$).

An independent-samples *T*-test revealed that the PI group ($M = 5.26$, $SD = 1.01$) scored significantly higher on the dimension ‘sense of control’ than the NI group ($M = 4.91$, $SD = 1.09$) ($M = 0.35$,

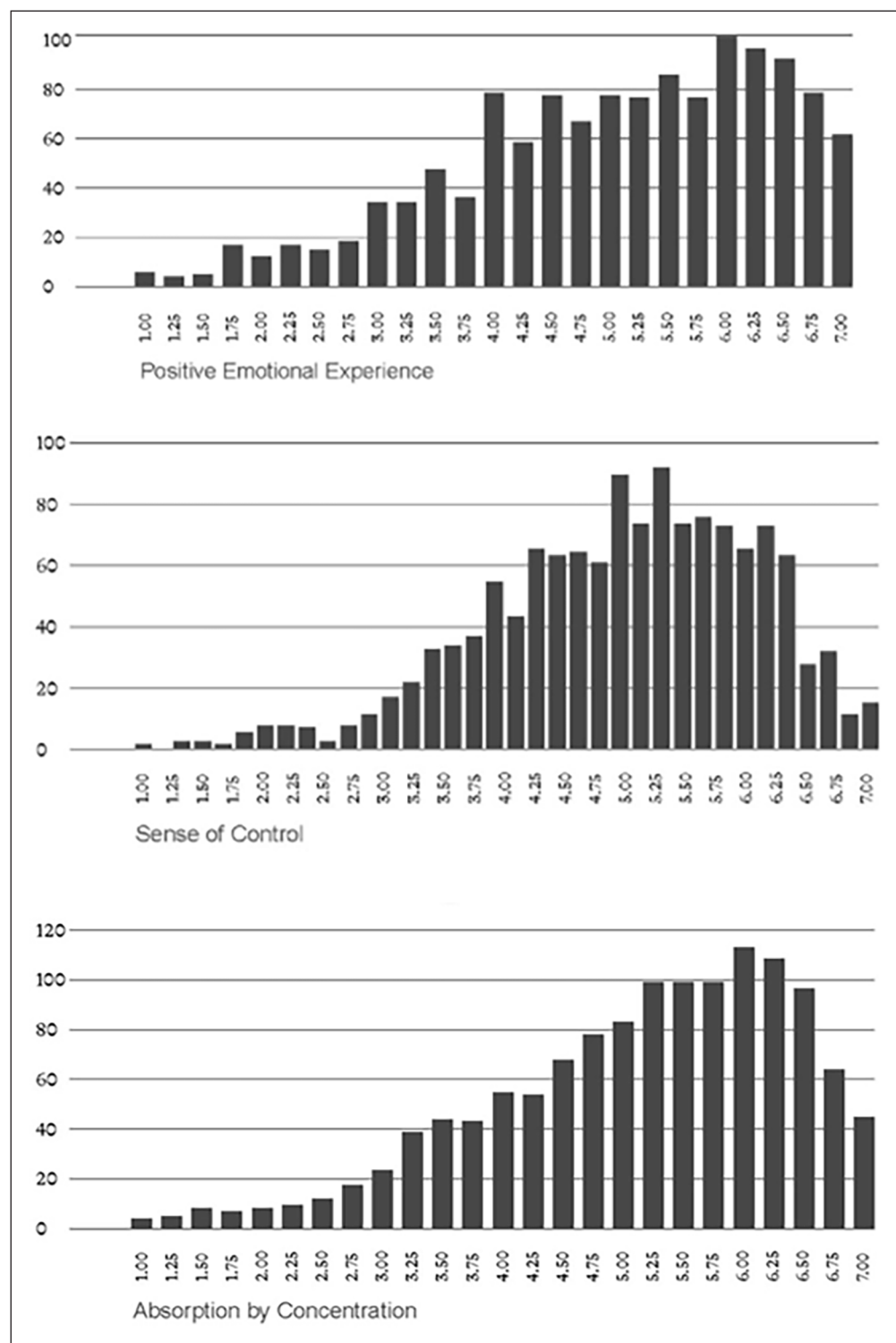


Figure 1. Results flow scale (overall scores per dimension).

Table 4. Comparison instrument – no instrument/lessons – no lessons.

Flow scores	Mean	SD
Play instrument		
Yes (<i>n</i> = 296)		
Absorption	5.225	1.23
Posemotex	4.994	1.39
Senseofcont	5.260	1.02
Total Flow	5.183	0.98
No (<i>n</i> = 986)		
Absorption	5.088	1.27
Posemotex	5.045	1.35
Senseofcont	4.911	1.01
Total Flow	5.000	1.02
Total (<i>N</i> = 1,282)		
Follow lesson		
Yes (<i>n</i> = 186)		
Absorption	5.177	1.29
Posemotex	4.927	1.42
Senseofcont	5.287	1.03
Total Flow	5.152	1.03
No (<i>n</i> = 110)		
Absorption	5.359	1.12
Posemotex	5.107	1.31
Senseofcont	5.218	0.98
Total Flow	5.226	0.89
Total (<i>N</i> = 296)		

95% CI [0.20, 0.49], $t(1280)=4.89$, $p<.001$). No significant differences were found between the PI and NI groups on the two other factors: ‘absorption by concentration’ (PI $M=5.24$, NI $M=5.08$, $p=.06$) and ‘positive emotional experience’ (PI $M=4.99$, NI $M=5.04$, $p=.57$). Looking at the total flow score, we observe that the PI group ($M=5.18$, $SD=.98$) has a higher total flow score than the NI group ($M=5.00$, $SD=1.02$), a statistically significant difference, $M=0.18$, 95% CI [0.04, 0.31], $t(1280)=2.68$, $p<.01$. An independent-samples *T*-test was run to determine whether differences in flow exist between students who follow instrument lessons and those who play an instrument without taking lessons. No significant differences were found regarding total flow and the three factors. In addition, no significant relationship (Pearson correlation) was found between the number of years spent playing an instrument and flow, $r(296)=-.09$, n.s.

When examining differences in gender, we found that female students score significantly higher on flow than male students. There was homogeneity of variances for the scores for both groups ($p=.27$). An independent-samples *T*-test revealed that the female group ($M=5.13$, $SD=.035$) experienced significantly more flow than the male group ($M=4.91$, $SD=.046$) ($M=0.22$, 95% CI [0.10, 0.33], $t(1280)=3.77$, $p<.001$).

Finally, the flow scores systematically decrease as age increases (Table 5). A Pearson correlation coefficient was calculated to assess the linear relationship between the age of the students and the occurrence of flow. We could observe a small negative correlation between age and total flow, $r(1282)=-.19$, $p<.001$. The same trend applies to all three flow factors (sense of control

Table 5. Flow scores based on age.

Age	N	Mean flow
11	4	5.68
12	379	5.27
13	604	5.06
14	268	4.73
15	24	4.63
16	3	4.02

$r(1282) = -.13, p < .001$, absorption by concentration $r(1282) = -.17, p < .001$, positive emotional experience $r(1282) = -.18, p < .001$).

Survey of teachers

Fourteen music teachers (M age = 33, $SD = 6.6$) participated in the survey. The teachers played a variety of instruments and have been teaching for an average of 11 years. Their overall impression of the lesson was positive. For all teachers except one, it was a new experience, both for them and their students. Most teachers deemed the openness in the lesson valuable, giving the students space to discover themselves and experiment with sound as illustrated in this quote: ‘it was very nice to make students experience that anything can be done; that they shouldn’t be afraid to play mistakes on their chosen instrument – I definitely want to keep adding this to my lessons in the coming years’ (T2). However, two teachers indicated that they had to get used to the sometimes-chaotic outcome. One teacher said that ‘it was nice to make students feel that anything goes and they should not be afraid to make mistakes on their instrument’ (T5). The positive opinion about the lesson and the students is illustrated by this quote (T3): ‘It was great fun for the students, an ideal introduction to free improvisation. For me, it was not always easy to let them go, I often tended to direct. Maybe I wanted the result to be more qualitative, while for the students the process was more valuable?’. Two teachers found the assignments to be too open and insufficiently framed, especially for children with special needs.

According to the teachers, the students’ reactions were very positive. The students reacted enthusiastically, and they could indulge themselves. As one teacher said: ‘At first they were hesitant but after a while they reacted full of enthusiasm’ (T10). Conversely, some students were at times disturbed by the ‘noise’, missed a finished product and had difficulty controlling themselves because of the free character of the lesson. According to one teacher, it was noticeable that students who do not take instrument lessons especially enjoyed the lesson (T1). The students who are in music school preferred to play music in the ‘classical’ way. Another teacher said that ‘it was a very nice lesson, most of the students are very enthusiastic, others don’t like it, but that’s the case every lesson’ (T12). Several teachers indicated that the pupils liked the fact that they ‘could not do anything “wrong,” that they could try out several instruments and that they could do what they wanted, within their limits’ (T6).

All the teachers who participated in the study expressed their intention to continue using these exercises in the future. They were convinced about the effectiveness of the approach in engaging the whole class group and found it valuable to work with.

Some teachers were already using similar forms of exercises in combination with a beat or drone or preferred the combination of free improvisation with ‘more structured improvisation tasks using melodic instruments and pentatonics’ (T9). A few teachers suggested that such lessons work

best in combination with other, more structured lessons. A teacher stated that ‘performing a lesson created by someone else creates a threshold, but the experience was still positive’ (T12). Two teachers continued with the exercises in the next lesson, one stated that she focused on ‘giving the students more space during improvisations and being attentive to the different musical building blocks during improvisation, such as pitch, tempo, dynamics, and timbre’ (T3).

Discussion

Musical improvisation is acknowledged by many scholars as a valuable pedagogical instrument for fostering creativity in general education (Edmund & Keller, 2020; Larsson & Georgii-Hemming, 2019; MacDonald & Wilson, 2020). Given the fact that still little is known about how students in general education engage in improvisation, how they experience such engagement, and that there is a need for more empirical studies in music in secondary education (Larsson & Georgii-Hemming, 2019), we conducted a large-scale study with secondary school students. Fourteen teachers implemented a series of activities in their classroom, that were designed for this study based on collective free improvisation. To probe the students experience, we used a flow scale, as the relation between musical improvisation and flow is widely accepted (Korošec et al., 2022; MacDonald & Wilson, 2020).

Results on the overall flow scores suggest a moderate to high degree of task-oriented absorption by concentration during the improvisation activities, as well as the presence of positive emotions and enjoyment, and the feeling of being able to perform the task well. These findings are in line with the literature about the relation between flow and free improvisation (Habe & Biasutti, 2023; Edmund & Keller, 2020; Ng, 2018).

Different studies indicate the potential of CFI to connect people from diverse musical backgrounds and achieve a mutual understanding (Ng, 2018; Thomson, 2007; Van der Schyff, 2013). In our study, the target group consisted of students who already played an instrument, and students who did not play any instrument. The former have a higher score on the factor ‘Sense of Control’. This finding is in line with the vast amount of literature about the link between skill training (leading to a higher ‘sense of control’) and improvisation (Edmund & Keller, 2020; Larsson & Georgii-Hemming, 2019; Wopereis, 2013). However, both groups do not differ regarding ‘Absorption by Concentration’ and ‘Positive Emotional Experience’. The latter suggests that through CFI activities, these diverse groups developed ways of collectively engaging with music. While most studies mainly involve student-musicians (Habe & Biasutti, 2023; Larsson & Georgii-Hemming, 2019), our results suggest that also non-musicians can gain positive experiences when involving in CFI activities. Following Hickey’s (2015) study on free improvisation pedagogues, CFI offers a more inclusive and creative music experiences to students. Our study responds to the need to examine CFI experiences from the participant perspective, as clearly demanded by different scholars (Hickey, 2015; Larsson & Georgii-Hemming, 2019).

While the concept of flow is not inherently linked to gender (Csikszentmihalyi, 1990), male and female students seem to differ in the extent to which flow experience occurs. Among the female students, we observed a significantly higher flow score, which contradicts previous findings indicating that girls exhibit less flow during improvisation or hold a negative disposition towards it (Korošec et al., 2022; Rowe, 1995; Wehr-Flowers, 2006). One possible explanation could be that many studies on the concepts of flow and improvisation primarily focus on jazz education (Korošec et al., 2022), showing that female musicians more often avoid improvising and ‘have more negative attitudes and feelings associated with improvising’ (p. 350). Regarding our finding that female students exhibit a higher level of flow, we lack a clear explanation. Maybe this is due to the improvisational approach in our study, that is more experimental and collaborative in nature.

As for the teachers’ survey, the results showed a positive but nuanced picture. While, according to the teachers, most students reacted enthusiastically, this was not always the case for all students,

indicating differences per teacher and per class. Regardless of these differences, all teachers involved in our study expressed their willingness to continue using CFI exercises in the future and experiment themselves, indicating that our lesson sheet provided a pleasant and positive experience for them as well. This aligns with recent studies by Ng (2021) and Nikolaou (2023) regarding the effect on teachers' self-confidence and willingness to engage in CFI.

Limitations and further research

Our study addressed an underinvestigated topic, namely CFI in general schools, and is one of the scarce large-scale ($N=1,282$) studies on this topic. However, some limitations need to be considered. For example, despite the large sample of students, the number of involved teachers ($N=14$) was rather small. Possibly, the teachers volunteering to participate in the study already had a positive attitude towards the use of CFI. However, the participating teachers were mainly classically trained, with little experience in impro. As such, the proposed activities were new to most of them. While we probed their background and attitude in the teachers' survey, it was not the focus of the present study. In the near future, we plan to conduct a follow-up study for the teachers to determine their current integration of improvisational exercises. Another limitation concerns the fact that our study involves only one single lesson. While this is not exceptional, it might be argued that a single lesson is insufficient to gain insight into students' lived experiences. For example, results on flow might be induced due to the novelty of the experience rather than by the nature of the activity itself, namely CFI. Further research could therefore implement a series of lessons with repeated measurement of flow experience. In addition, different aspects of the lesson could be diversified, so as to gain a deeper understanding what leads to experiencing flow.

Furthermore, using a self-report scale may be considered a limitation (Pekrun, 2020). For example, responses may be impacted by the persons emotional state or the group dynamics. The surveys in our study were administered by the class teacher, perhaps resulting in responses that students consider the most socially acceptable within the classroom context.

Finally, since we deem the three-factor structure of the flow scale interesting for music education, a confirmatory factor analysis and a validity study of the translated scale might be a next step as well as the possibilities to use the scale in (self) evaluation of musical tasks.

Conclusion

Our study indicates that the lived experience of students in secondary general education with a CFI lesson can be seen as a positive encounter. Flow measurement showed medium to high scores. We observed no differences in flow between the students who play an instrument and those who don't play an instrument on the factors 'Absorption by Concentration' and 'Positive Emotional Experience'. Conversely, students who play an instrument score higher on the factor 'Sense of Control'. The findings of our study indicate that engaging in CFI facilitates musical expression, no matter one's technical and musical competence, and that free improvisation exercises in general education positively impact both students and teachers. We conclude that CFI activities are suitable for music lessons within general education because of their inclusive nature. The results show that students felt focused in the lesson, that time went by quickly, that they were able to perform the exercise well, found the exercise enjoyable and wanted to repeat it and that CFI tasks are a good way to include all students in active musical play. We see the latter as important elements for music education in schools. We consider CFI in the general classroom as an inclusive way to establish musical communication and activate musical experiment. It is 'because [the arts] are an arena without right or wrong answers, they free students to explore and experiment' (Winner et al., 2013, p. 265). We believe that in an increasingly result-driven school system, the use of CFI can play a role in developing collaborative skills and risk-taking and strengthen inclusive musical and social interaction.

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Author contribution(s)

Filip Verneert: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Validation; Visualization; Writing – original draft; Writing – review & editing.

Luc Nijs: Supervision; Writing – original draft; Writing – review & editing.

Thomas De Baets: Supervision.

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Ethics statement

The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article. Apart from the written consent, LUCA School of Arts did not require additional ethical approval.

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Data availability statement

The raw data supporting the conclusions of this article will not be made publicly available because the terms of consent for research participation did not specify that data would be accessible other than by the research team. The initial coding is accessible at LUCA School of Arts.

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Appendix I

The Flow State Scale for Occupational Tasks (Yoshida et al., 2013, p. 61).

Please recall your experience of the task or activity you just completed and answer the following questions. There are no right or wrong answers, so please answer intuitively. For each question, circle the number (1–7) that best matches your experience.

Appendix 2

This is a confidential (anonymous) questionnaire about your own experience with the improvisation lesson as part of the research project of (Filip Verneert - KU Leuven). Your answers may be as long or short as you like. Thank you very much for your cooperation!

1. What is your name and age?
2. What instrument(s) do you play?
3. How long have you been teaching?

4. What was your overall impression about the lesson(s)?
5. How did the students respond in general?
6. Share your thoughts regarding the reactions of the students? (pos/neg)
7. Would you continue to use this or similar forms of work in your classes in the future?
8. Anything else you'd like to add?

Appendix 3

Lesson Plan #1



Making Music out of Strange Sounds

Material

One instrument per student, ensure a good balance of string, wind, and percussion instruments. Voice and body percussion can also be used.

The exercises are best done with a variety of sounds as wide as possible. Percussion instruments such as shakers and tambourines are less suitable because of the limited possibilities in sound and playing technique. If possible, students bring their own instrument.

Whiteboard or screen.

General information

The Dutch lesson plan was translated, respecting the intended spirit and meaning of the original lesson.

Grade level: second grade general education

Length of class: 50 minutes

Learning-behavioral goals

- The students experiment in function of a defined task with the musical building blocks, their voice, their body, musical instruments and (basic) techniques.
- The students make music together with attention to group playing and its synchronization.
- Students use their imagination in a focused way when creating artistic work.
- Students use provided strategies that stimulate creative thinking.

Lesson Plan

1

1. Warming up (10 min)

All the students choose an instrument, play their own or sing. Everybody stands up in a circle.

Material

One instrument per student, ensure a good balance of string, wind, and percussion instruments. Voice and body percussion can also be used. The exercises are best done with a variety of sounds as wide as possible. Percussion instruments such as shakers and tambourines are less suitable because of the limited possibilities in sound and playing technique. If possible, students bring their own instrument.

Whiteboard or screen

The lesson starts by freely improvising on a musical instrument, voice or body percussion where the only constraint is the volume.

Instruction: try to play very quietly on your instrument and look around and try to hear all the other instruments. Then pick another person, look at them and try to consciously hear the instrument you are looking at, while still playing your own instrument. Adapt the volume if necessary.

2. The Volume Knob (10 min)

This is an exercise to explore sound possibilities and playing techniques of instruments through collective improvisation. At the same time, students learn to listen to each other. The idea is to collectively play louder or more quietly represented by numbers 1 to 8, representing a gradually increase of the volume.

Numbers 1 to 8 are written on a whiteboard:
1 2 3 4 5 6 7 8.

The number 8 represents the loudest one can play, 1 for the quietest. The volume knob is turned from 8 to 1 is slowly turned down. This is done by the teacher or a student pointing at the numbers (1 to 8 or 8 to 1).

Instruction: try to reduce the volume in eight equal parts and listen to what happens with the collective sound. Really try to diminish or increase the sound with the whole group.

Level 1 represents can be only blowing air into a wind instrument, rubbing a percussion instrument, or pressing piano keys without striking a note.

You can also choose a motif of a few notes or sounds that you can repeat during the dynamic change.

Lesson Plan

1

3. Loop groove

Material

One instrument per student, ensure a good balance of string, wind, and percussion instruments. Voice and body percussion can also be used. The exercises are best done with a variety of sounds as wide as possible. Percussion instruments such as shakers and tambourines are less suitable because of the limited possibilities in sound and playing technique. If possible, students bring their own instrument. Whiteboard or large paper to drawn on.

This is an exercise on concentration, timing, listening to what is going on around you and keeping tempo. The starting point, as in the first exercise, is the numbers from 1 to 8 on the board. Each student chooses a number. When it is indicated, he plays a maximum of one or two notes, a sound or a chord. Each student chose a number from 1 to 8 plays (a chord, some notes or a sound) only when their number is pointed out by the teacher. Play a groove using a loop from internet or a drum machine. The idea is that after a while the teacher can stop pointing out the numbers and the class goes on in a collective call and response loop.

Instruction: make up a sound with a few notes and play them only when I indicate the number you chose. If nobody chooses a certain number, then there is silence. You will hear a beat but when the beat stops, just keep on playing.
(for the teacher: use a repeat sequence e.g. 32165487 – 32165487 – 32165487 or experiment with your own variations using less numbers and so on).

4. 3-part collective sound making (15 min)

a collective musical improvisation based on pictures and texts. You can chose the pictures (3 pictures as a short story and/or a short 3 part text story).

Instruction: play something that represents the idea of the picture for you, listen to the rest of the group. Each student choses 2 of the three pictures to play on. This is a small example:

- 1 A drawing of a smiling person under a sunny sky.
- 2 The person slips over a banana peel and falls down.
- 3 The person is in pain and stumbles in the rain.