

The European Journal of Social and Behavioural Sciences  
EJSBS Volume XVIII, Issue I (e-ISSN: 2301-2218)

## CADENZA: AN ONLINE TOOL FOR TRANSFORMING MUSIC LEARNING

Rena Upitis<sup>a\*</sup>, Philip C. Abrami<sup>b</sup>

<sup>a</sup>*Faculty of Education, Queen's University, Kingston, Ontario, Canada*

<sup>b</sup>*Centre for the Study of Learning and Performance, Concordia University, Montreal, Quebec, Canada,*



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### Abstract

Many enthusiastic youngsters begin music lessons with expectations of quickly developing musical proficiency. But the process is long, and traditional weekly music lessons are not ideal for sustaining students' motivation. The purpose of this case study was to describe and document the ways in which Cadenza, a digital music tool, could enable students to persist with lessons and practice, thereby achieving long-term musical success. Benefits and challenges of using Cadenza were explored using a case study methodology. Results indicated that Cadenza enabled the teacher to create comprehensive practice plans, to review progress between lessons, and to provide structured feedback between lessons. The students used Cadenza to time and track practice sessions, to reflect on learning, and to communicate with the teacher between lessons. Cadenza appears to hold promise for guiding students between lessons and for motivating them to persist with their musical studies. According to the teacher, the students learned to practice more effectively and made more rapid progress by using Cadenza. The paper concludes with a discussion of the difficulties of integrating digital tools into music study, highlighting how such tools can challenge traditional pedagogical practices.

*Keywords:* Digital Music Tools, Self-Regulated Learning, Private Music Instruction

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\*Corresponding author.  
E-mail address: rena.upitis@queensu.ca

doi: 10.15405/ejsbs.201



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## 1. Introduction

Many enthusiastic youngsters begin music lessons with expectations of quickly developing musical proficiency (McPherson, Davidson, & Faulkner, 2012). But the process is a long one, and traditional weekly music lessons are not ideal for sustaining students' motivation. Further, contemporary music students are drawn to social media and digital devices, which, in turn, often pull them away from the kind of concentrated practice that is needed to master a musical instrument. But could it be possible to engage students in musical studies *through* digital music technologies?

The purpose of the present study was to describe and document the ways in which Cadenza, a digital music tool, might enable students to persist with lessons and practice and to achieve musical success over time. Benefits and challenges of using Cadenza were explored, guided by the following two research questions:

1. Can digital tools, like Cadenza, motivate and guide students to become capable musicians?
2. In what specific ways can digital tools enable students to practice between lessons and progress more quickly?

## 2. Literature Review

Cadenza (<http://www.cadenzamusictool.ca>) is an online electronic portfolio that is used by teachers and students, both during lessons and in weekly practice. Research shows that online electronic portfolios can support student learning in a variety of subject areas, including music, especially when digital tools are designed to support student self-regulation (Brook & Upitis, 2015; Dignath, Büttner, & Langfeldt, 2008; Winsler, Ducenne, & Koury, 2011). Cadenza was designed to support self-regulation by inviting students to set goals, engage in effective task strategies, and reflect on their practice. The evidence shows that students with higher levels of self-regulating behaviours generally develop strong performance skills and experience more fulfillment as musicians (Varela, Abrami, & Upitis, 2014; Zimmerman & Schunk, 2011). Accordingly, we hypothesized that by embedding self-regulating features into Cadenza, students would experience successful learning and develop their musicianship.

In order to develop musicianship fully, it is crucial that students remain in music lessons long enough to develop self-regulatory mechanisms to acquire the skills required to play their chosen instrument. Researchers have found that one of the most important predictors of long-term musical engagement and success is motivation on the part of the student (de Bézenac & Swindells, 2009; Martin, 2008; McPherson & McCormick, 2000). Bonneville-Roussy and

Bouffard (2015) posited that the combination of accumulated practice, self-regulation, and deliberate practice strategies would predict musical achievement. They found evidence for a latent variable they called formal practice, comprising self-regulation, deliberate practice, goal direction, and focussed attention. Bonneville-Roussy and Bouffard concluded that formal practice was most effective when a positive motivational profile was combined with considerable practice time.

Another body of literature germane to the current study is the research examining the relationship between teachers, students, and parents. Research has demonstrated that when teachers, parents, and students share a mutual understanding of goals and purpose, students are more likely to experience success (Duke, 1999). Creech (2009) examined the interpersonal interactions in the parent-teacher-student triad in terms of student self-efficacy, satisfaction, enjoyment, motivation, and self-esteem. She demonstrated that the most effective learning occurred when parents, teachers, and students communicated well, demonstrated mutual respect, shared a sense of common purpose, and adopted child-centred or self-regulatory goals. Both Cadenza and the related Notemaker app were designed to support these kinds of interactions.

### **3. Method**

#### *3.1. Methodology and teacher selection*

This was a six-month case study of a single music teacher and her students, following the protocols of case study research (Yin, 2009). Research was conducted in accordance with the Canadian Tri-Council Policy Statement governing research with human participants (Canadian Tri-Council, 2010).

The teacher recruited to take part in the current study was chosen on the basis of several criteria including (a) familiarity with digital music tools to support student learning, (b) a substantial studio practice, (c) an interest in deepening and improving her own pedagogy, and (d) active participation in teacher professional development.

#### *3.2. Data collection and analysis*

Data comprised six video-taped lesson observations, responses to a 120-item teacher survey, screen captures of the teacher and student Cadenza files, email exchanges, and a semi-structured exit interview which included a think-aloud protocol of a video-taped lesson. The survey was developed in consultation with the project advisory board, made up of 30 members representing Canadian and American music teacher associations, music publishing and independent music teachers. It was piloted at the Canadian Federation of Music Teacher's

Association conference to test item reliability and construct validity (Upitis, Brook, Abrami, & Varela, 2015). The survey was also used in a previous study, where again, validity and reliability were established (Upitis, Abrami, Brook, Boese, & King, 2016). Archived versions of the survey, in both English and French, can be found at <http://www.musictoolsuite.ca/research/instruments/>. Interview questions were also based on an earlier protocol, established with 20 Canadian studio teachers who took part in an extended case study (Brook, Upitis, Troop, Varela, & Abrami, 2014). Survey and interview questions were used to document the pedagogical practices of the teacher as well as to determine the ways in which the teacher employed Cadenza and other digital technologies, both during and between lessons. Throughout this paper, the teacher and her students are referred to by pseudonyms. The interview, lesson observations, survey, and screen captures were analyzed according to established protocols for qualitative data (Creswell, 2012).

## **4. Results**

### *4.1. Teacher Characteristics*

Jackie's greatest teaching joy was the challenge of meeting her students' needs. She also identified sharing her love of music with others and collaborating with fellow teachers as central to her enjoyment of the profession. Motivating students to practise, managing parental expectations, and developing lifelong musicianship were identified as her greatest challenges. Keeping abreast of new technologies was not an issue for Jackie. Jackie regularly attended teachers' association meetings and workshops, accessed both print and digital materials about music pedagogy and teaching, and took music lessons to improve her own musicianship.

Jackie taught close to 40 hours a week, and almost half of her family's household income was derived from teaching. She lived in the country, in Ontario, Canada, and had advanced performance qualifications from The Royal Conservatory (Canada) at the time that the study took place. Jackie had been teaching piano and theory for close to 25 years, and she had 57 students in her studio when the data were collected. Nearly all of her teaching was one-on-one instruction, half of which she carried out in her home studio, with the remaining half taking place in local schools. Most of the repertoire she taught was classical and/or jazz and blues. Each lesson involved playing repertoire from notation and by ear, and most lessons also included sight-reading and theory. Most of Jackie's students stayed with her for eight to ten years, and she taught students ranging from 6 to 18 years of age. While a few of her students were advanced, most were at the elementary or intermediate levels.

About a third of Jackie's students took exams in the year during which this study took place, and they were motivated to do so because of Jackie's encouragement, and for the recognition of successful progress. Jackie reported exam costs as being most prohibitive factor associated with exam taking.

To support practising between lessons, Jackie's students used notes that she had written for them during the lessons, recordings of performances by others, games and apps on their mobile devices, checklists, and parental support. Jackie used a range of indicators to judge progress, including increased enthusiasm and interest, the desire to perform and take exams, increased confidence, and her own overall observations and judgments about musical engagement.

Jackie identified engagement with non-musical after school activities and lack of motivation to play outside of lessons as the two factors that contributed most to lack of practice. For her, important teaching practices included setting practice schedules, setting student goals for the year along with the student, setting goals for between lessons, ensuring that strategies for learning were identified, breaking down complex tasks, and helping students become independent musicians.

Jackie reported regular use of digital tools both for administrative tasks (e.g., communicating with parents and students and billing) as well as for pedagogy (e.g., locating recordings, supporting ear training, and accessing professional resources). She believed that technology improves student learning and increases students' motivation to learn, but that it also required support from parents to be effective. Jackie felt that technology could be used to set goals, keep weekly records, support practising, reflect on progress, and to share and critique musical performances.

#### *4.2. Using Cadenza*

Cadenza was used by 30 of the 57 students in Jackie's studio. Of the students who did not use Cadenza, 25 of them were under the age of 7 years and did not have the requisite facility with technology to make use of the tool.

Integrating Cadenza into studio teaching involved little adjustment on Jackie's part, as the pedagogical practices she already exhibited, as evidenced in the video-taped lesson observations, lent themselves well to using the Cadenza tool. To illustrate the process of integrating Cadenza into the studio, we used a lesson observation with a 15-year-old male student at the intermediate level without Cadenza as a baseline observation, along with a think-aloud interview protocol, to ascertain changes in the studio and pedagogy with the integration of Cadenza.

The first change was a physical one. To integrate Cadenza into her studio, Jackie brought in a small table, situated next to the piano, to hold both the laptop computer and a smartphone. The stool next to the table rotated easily between the table and the piano. Typically, while the student was playing, Jackie began typing directions into Cadenza, where she previously would be writing notes with a pencil into the student's instruction book. Because the computer was now present at the lesson, Jackie reported that she often searched for YouTube recordings to illustrate both effective and poor performance techniques, which she did not do during the lesson prior to the use of Cadenza. In addition, since introducing Cadenza into her studio, Jackie reported using the Notemaker app, which can be integrated with Cadenza, to see if students could identify their own errors, such as a break in the musical line, from a video captured on the phone during the lesson itself.

In addition to these subtle, but important changes that took place during the lessons, Jackie also reported changes to her teaching practice during the time between lessons. Most notably, Jackie reported regularly communicating with her students using Cadenza. In addition, she reported corresponding with her students through text messaging as well. Communications with parents were also more frequent. She identified more frequent and meaningful discussions with parents about student progress as one of the key changes that occurred in her practice, as a result of using Cadenza. Most often these discussions were targeted towards supporting the learning of repertoire and developing habits of self-regulation.

#### *4.3. Benefits and Challenges of Using Cadenza*

The interview overwhelmingly revealed that Cadenza was a welcome addition to Jackie's studio practice. She readily identified ways in which her students' learning improved by using Cadenza, including (a) engaging students who were not previously engaged, (b) involving parents directly in supporting practice, (c) greater success on examinations and other musical milestones, and (d) benefitting from connecting with the teacher between lessons. Regarding the mid-week connections, Jackie described a student telling her, "I really wanted to practise because I knew you were watching me improve." When Jackie first began using Cadenza with her students, she checked on their progress carefully and regularly, and answered any concerns immediately. Once her students became established with Cadenza, she found it less important to check as often and to respond to everything. That said, when students were particularly keen on a mid-week response, she encouraged them to use the teacher notification feature of Cadenza to capture her attention in a timely way.

Other features that Jackie identified as being crucial to the success of Cadenza were the use of colour to identify musical tasks, in ways that weren't anticipated in the Cadenza design. She described how in one family, where she teaches twin girls, she colour codes their instructions in a single Cadenza account under the father's name. The father reported that his daughters were engaged, in a playful way, both with Cadenza and with one another. As their practice targets were achieved, the father claimed that, "practising feels like fun." Jackie also indicated that the emoticons, timer, and total practice time features were very important to her students. She was especially surprised at how much the students liked the timer, and how it motivated them to practice more often. Jackie also appreciated that the amount of time practised was easy to track for students, noting that viewing practice times not only served to motivate students, but also opened up conversations about how much practise was possible and desirable between lessons.

Challenges of using Cadenza were few. While Jackie had some suggestions about improving the tool (e.g., a cut and paste function for checklists, and changing the placement of the task title on the screen), overall the tool was regarded as user-friendly and helpful for documenting practice strategies and engaging students.

There were some features of Cadenza that Jackie used rarely or not at all. These included the integration of the Notemaker app with Cadenza, the private notes function, student goal setting, and composition and improvisation. Jackie speculated that while she used Notemaker as a stand-alone app, one of the reasons that she did not integrate Notemaker with Cadenza was that it was not available in the teacher view. In other cases, Jackie predicted that she would be more likely to use features at the beginning of the academic year, including, most notably, goal setting. That Jackie did not use the composition option for Cadenza was more likely a function of her pedagogical practices than the technology, that is, composition and improvisation were not part of her regular teaching practice.

The screenshot displays the Cadenza teacher interface. At the top, there is a navigation bar with the Cadenza logo, a search icon, a notification bell, and a user profile icon. Below this, there are buttons for 'New Lesson', 'Notes', and 'Goals'. The main content area is divided into a left sidebar and a main panel. The sidebar shows a list of tasks: 'Triads' (4 circles), 'Dominant 7ths' (4 circles), 'Hedwig's Theme' (4 circles), 'Waltz' (4 circles), 'Rondo' (4 circles), and 'Sarabande' (4 circles). Below the list are buttons for 'New Task' and 'Reflection'. The main panel shows 'TASK 1 OF 6' and 'Triads'. The task description includes: 'Alternate Solids and Broken I-V-I Cadence', 'RH goes to 1st inversion', 'Thumb goes down WT if you are in a major key, down a ST if you are in a minor key', 'Pinky goes down a ST to finger 4', and '2 stays put'. A checklist follows with items: 'G+ Solid', 'E+ Solid', 'B+ Solid', and 'D flat+ Solid'. A 'PRACTICE LOG' table shows two entries: '2. Tue Jun 14, 2016' and '1. Thu Jun 9, 2016', both with a duration of '0h 07m'. A 'Technique' button is visible in the top right of the main panel.

**Figure 1.** Teacher view showing task description, checklist, targets, and practice logs of a student mid-week

## 5. Conclusions and Implications

Cadenza appears to hold promise for guiding students between lessons and for motivating them to persist with their musical studies. The teacher reported that students learned to practice more effectively, and made more rapid musical progress by using Cadenza. In addition, this digital music tool enabled the teacher to create comprehensive practice plans, to review progress between lessons, and to provide structured feedback between lessons. The students used Cadenza to time and track practice sessions, to reflect on learning, and to communicate with the teacher between lessons.

Incorporating Cadenza into the teacher's practice appeared to be accomplished with ease. The tool led to two broad changes in pedagogy: the teacher (a) used musical digital technologies during the actual lessons, and (b) began to systematically communicate with students between lessons. This between-lesson communication appeared to increase motivation and progress on the part of the students. However, it also required adjustments on the part of the teacher in order to ensure that mid-week communications did not become a burden. Future research might explore ways that teachers can account for this mid-week check-in practice, both in terms of scheduling and compensation for their time. We anticipate that as the user base for Cadenza grows, the teachers themselves, through their own professional



networks, will share pedagogical challenges and successes, which we will subsequently integrate into our research program, as well as our online professional development and support.

### **Acknowledgements**

This research was made possible by funding from the Social Sciences and Humanities Research Council of Canada [grant number 895-2011-1000]; the Canada Foundation for Innovation; Queen's University; Concordia University; and The Royal Conservatory of Music. The authors are grateful to the teacher who willingly shared her studio practices for this study. The authors also acknowledge the contributions of Jane Willms and Karen Boese.

The author(s) declare that there is no conflict of interest.

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