

Requirements for Piano Lesson Support System

Developing “Piano Lesson Whole Visualization System”

Naoki Morita

School of Information Telecommunication Engineering
Tokai University
Tokyo, Japan
e-mail: morita@tokai.ac.jp

Kenta Morita

Faculty of Medical Engineering
Suzuka University of Medical Science
Mie, Japan
e-mail: morita@suzuka-u.ac.jp

Chiharu Nakanishi, Chiaki Sawada

Kunitachi College of Music
Tokyo, Japan
e-mail: {nakanishi.chiharu, sawada.chiaki}@kunitachi.ac.jp

Kazue Kawai

Miyagi University
Miyagi, Japan
e-mail: kawaik@myu.ac.jp

Abstract—The authors aim to pass on the tradition of classical music to the next generation by greatly reforming and evolving the traditional pedagogy of piano education using Information and Communication Technology. Specifically, we aim to shift the paradigm from conventional subjective performance learning that rely on sensitivity and memory of lessons to objective, independent and autonomous performance learning through the sharing of objective performance video data. This presentation is a part of research of the “Whole Visualization of Piano Lesson.” This presentation reports on the necessary functions of the system and its implementation method, based on a questionnaire survey conducted to investigate current needs in preparation for the development of the “Piano Lesson Whole Visualization System.”

Keywords- piano; support; system; visualization; connections.

I. INTRODUCTION

This report is part of a study being conducted at a music college in Japan to pass on the classical piano tradition to the next generation. The Ideas, Connections, and Extensions model (ICE model) [1] is a framework that describes phases of learning. In the ICE model for piano, there is the Ideas phase in which students play the score with rhythmic and percussive accuracy, the Connections phase in which the learning elements of Ideas are applied to music with expression, empathy, and technical connections, and the Extensions phase in which the music resonates with the audience. With regard to these ICE models, previous studies of piano lesson in Japan [2]-[18] have focused on the Ideas phase for beginners using electronic keyboards. In these studies, the goal is for students to be able to read music and hit the keyboard in a precise rhythm without mistakes. This study will focus on piano lessons during the Connections phase.

The purpose of this study is to summarize the requirements for a piano lesson support system in the

Connections phase and how to achieve them. Specifically, we will analyze the problems in looking back at the lesson video archive. Then, we will examine what kind of support or functionality can be realized to make the most of the lessons, enhance students’ awareness, and link this to their improvement in piano playing.

The rest of this paper is organized as follows. Section II describes the flow of piano lessons in the Connections phase. In Section III, we conduct a survey on looking back piano lesson videos, and in Section IV, we present two key points for looking back piano lesson videos necessary for the development of the “Piano Lesson Whole Visualization System” and Section V provides our conclusions.

II. PIANO LESSON

In the Connections phase of the ICE model, expressiveness, empathy, and technical connections are important. The goal is for students to immerse themselves in the music and acquire the technical (physical) and sensory skills to perform a certain piece of music as they wish, even under pressure, in a practical exam, competition, or other performance.

The lessons leading up to a concert, competition, or other performance are given once a week for three to four months, as a standard practice.

A. Before the lesson begins: Preparation

Student: A student (1) reads score, (2) researches the piece, (3) listens to recordings by performers for reference, etc., and practices and studies on his /her own to get the piece in shape for the day of the lesson.

B. Every Lesson (beginning)

Student: The student performs through a piece of music.

Instructor: The instructor gives a critique (guide) of the student's performance. The instructor will discuss any

musical or technical problems the student may have, and will give the student the necessary tasks to complete the performance. The instructor will share the image of the piece with the student by mentioning the background of the piece, episodes, traditional (common) performance techniques, etc.

Student: After listening to the instructor's critique (guide), the student understands the task at hand. The student writes down the assignment in the score (the student is encouraged to memorize the critique heard from the instructor, not during the lesson, and to make a summary note after the end of the lesson). The student should also communicate to the instructor any problems or questions that emerge from the independent practice, and exchange opinions.

C. During the lesson

Instructor: The instructor asks the student to resume playing, stopping the performance at various points, and instructing the student to improve on the issues pointed out in B.

Student: The student immediately improves on the instructor's tasks based on the instructor's instructions. If the student cannot do so on the spot, the student shall make it an assignment until the next lesson.

D. Review at home

Student: At home, the student should try to overcome the tasks given by an instructor, relying on the experience and memory of the lesson and the writing on the sheet music, and connect them to the next week.

III. QUESTIONNAIRE SURVEY

Between April and May 2022, a survey on video review of performances was conducted on Google Forms [19]-[21]. The subjects were 20 piano instructors and 24 students at a music college, with 10 and 9 questions, respectively.

There are four main things that can be said from the instructors' and students' questionnaires.

1. Not a few of the students record their lessons. However, students rarely review all of their previously recorded lesson videos. Students do not have the time or motivation to watch a long lesson recording from beginning to end.
2. Students are dissatisfied with the content of the videos when they watch them. e.g. "I can't see how I touch the keyboard." "I can't see my own face and tone."
3. Students were dissatisfied with the video viewing. e.g. "It takes too much time to find the video I want to watch from the video archive," "It is difficult to pinpoint the part I am interested in," "It is difficult to go back in time to watch."
4. Students and instructors are dissatisfied with the device itself and the application when handling the device. e.g. "It is complicated to connect," "I don't know how to operate the application."

IV. REQUIREMENTS FOR THE SYSTEM

Based on the analysis of the needs of the questionnaires, the following two things are required to the system.

- (1) The system can instantly locate and view the part of the performance that the student wants to see.
- (2) The system can instantly locate videos of certain parts of the lesson at different recording times.

The "Piano Lesson Whole Visualization System" which we are developing this time, can be used to connect a score and video will locate:

- (1) a certain part of the lesson.
- (2) a certain part of the lesson at a different time for comparison of previous performance and current one.

The connection between the score and the video is made by comparing and associating the scale recognized from the score and the pitch recognized from the video. This allows the user to click on a section of the target score to bring up the playback position of the video. Furthermore, the score and the video taken at that time are automatically associated with the calendar with the date and time of the practice. This makes it easy to select videos for comparing one's own previous and current performances, or for comparing one's own performance with an instructor's model performance. For students comparing previous and current performances will be a great opportunity to improve their piano.

V. CONCLUSION

The purpose of this study is to summarize the requirements for a piano lesson support system in the Connections phase and how to achieve them. Specifically, we will analyze the problems in looking back at the lesson video archive. Then, we will examine what kind of support or functionality can be realized to make the most of the lessons, enhance students' awareness, and link this to their improvement in piano playing.

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